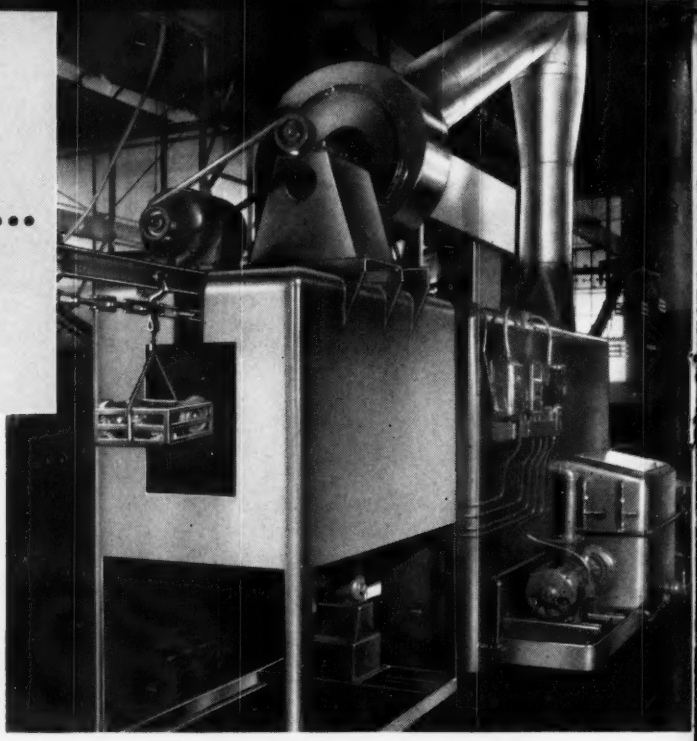
Products Finishing

CLEANING
PLATING
POLISHING
FINISHING

JANUARY 1953

"washes cleaner... dries dryer"



"does excellent job on hard-to-clean parts"

noted gear manufacturer reports on

Cincinnati
CLEANING MACHINE

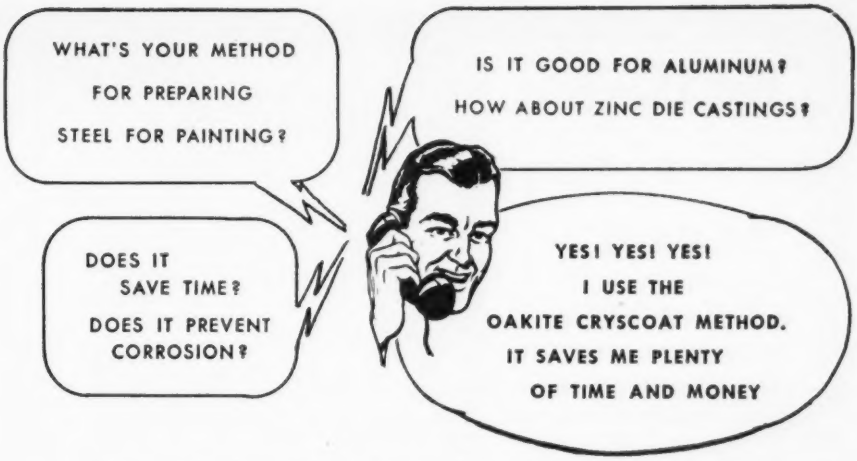
This Cincinnati engineered cleaning system at New Process Gear Corporation processes 20 gears per minute prior to inspection and assembly. Grease, oil and coolant are removed from difficult areas without injuring the easily-damaged parts. Smaller parts are cleaned even faster.

Typical benefits of Cincinnati engineering are illustrated in the heating system of this machine. To obtain maximum efficiency from the gas-fired heaters, combustion products are used in the hot air-blow-off. The heating system itself is equipped with a specially designed, gas-fired, submerged tube designed to utilize maximum heat content of the gas.

If cleaning and finishing are part of your production, a Cincinnati machine can increase efficiency, save time and lower costs. Write for full information.

Catalog available on request.

CINCINNATI CLEANING AND FINISHING MACHINERY CO., INC.
311 HECLA STREET, IRONTON, OHIO


WHAT'S YOUR METHOD FOR PREPARING STEEL FOR PAINTING?
IS IT GOOD FOR ALUMINUM? HOW ABOUT ZINC DIE CASTINGS?
DOES IT SAVE TIME? DOES IT PREVENT CORROSION?
YES! YES! YES! I USE THE OAKITE CRYSCOAT METHOD. IT SAVES ME PLENTY OF TIME AND MONEY

The OAKITE CrysCoat* PROCESS does three things at one time:

1 **Cleans metal rapidly**—removing cutting, drawing, stamping oils and compounds, rust preventives, fluxes, smuts and other soils.

2 **Conditions metal for painting**—preparing steel, aluminum, zinc die castings and other metals for lasting adhesion of paints, lacquers and enamels.

3 **Increases resistance to corrosion**—preventing it before painting; localizing it after painting.

Eliminating the need for separate cleaning and phosphating operations, the OAKITE CrysCoat PROCESS cuts costs these ways:

- **Uses less equipment**
- **Cuts operating time**
- **Reduces heating costs**
- **Saves cost of acid-proof equipment**
- **Reduces scaling and sludging**
- **Saves paint**
- **Reduces rejects**

FREE Write to Oakite Products, Inc., 20 Rector St., New York 6, N. Y., for a copy of *"The OAKITE CrysCoat PROCESS"* describing 19 advantages. *Reg. U.S. Pat. Off.

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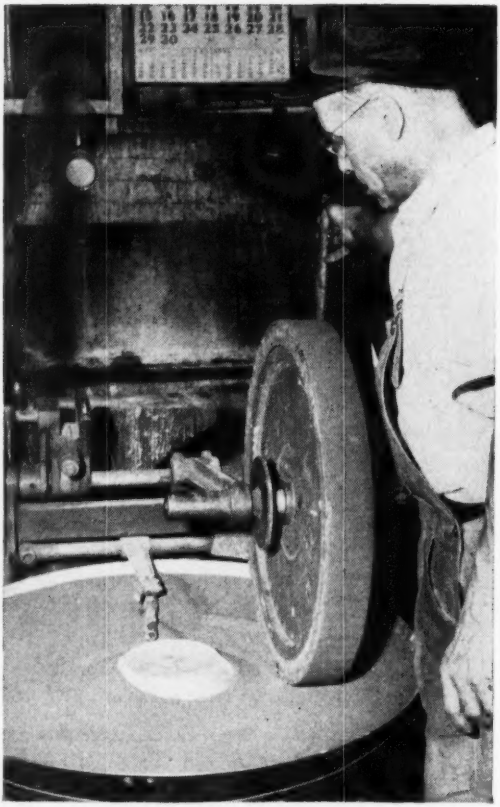
OAKITE SPECIALIZED INDUSTRIAL CLEANING MATERIALS • METHODS • SERVICE

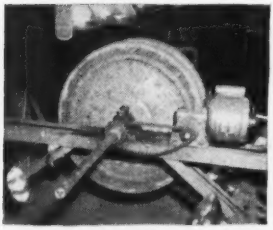
Put these practical tips to work for you

44-page book shows you how to set up metal polishing wheels and belts

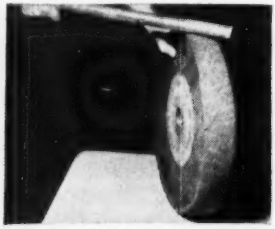
Plan now to take advantage of the wealth of information in the Norton Booklet No. 1340, "Setting Up Polishing Wheels and Belts." This useful booklet tells how to prepare the glue, how to set up wheels using either glue or cement, how to set up abrasive belts, how to get the best results from polishing. It contains detailed information on abrasive grain for polishing, including tables for selecting grains. Norton Company, Worcester 6, Mass. Distributors in all principal cities. Export: Norton, Behr-Manning Overseas Inc., Worcester 6, Mass.



HOW TO SET UP a polishing wheel. Glued wheel, shown here, is automatically rolled in a trough of abrasive grain. To minimize jelling, the setting-up operation is carried out as quickly as possible.



HOW TO DRY a polishing wheel. Infrared lamps dry wheels faster and permit smaller inventory of wheels. Note mechanism for rotating wheels easily. Ideal dry room maintains temperature of 85° F. and 50% relative humidity. When wheel cracks readily, it is dry.



HOW TO CRACK the wheel head. Wheel face is hit at about a 45° angle, being struck completely around the wheel once or twice. It is then hit at an angle that forms an "X" with the first series of cracks. A round bar or pipe, *not a sharp tool*, is used.

NORTON

ABRASIVES

Making better products to make other products better

I'll tell you why . . . because they're designed to take all the punishment of mass-production plating—and last far longer. Hanger assembly is built extra rigid to reduce maintenance. It slips right into those new-type saddle brackets on the tank for extra strong support plus greater ease in handling. That's a typical H-VW-M performance-proved feature.

And no matter what the plating problem there's an H-VW-M Mercil Type Cylinder built for the job. For example . . . Plexiglas, with ribless, one-piece, convex panel construction—ideal for temperatures to 180° F. . . . or Melamine, for use in temperatures to 210° F. Every type is available in a wide variety of sizes—with a broad choice of contacts—in addition to the standard flexible dangler. Individual motor drive is standard equipment, although bevel-gear drive is available if desired. You'll get a better plated product from these barrels—a more uniform deposit—*much more economically.*

Plating barrels are just one of many results of over eighty years of constant plating development—a continuing policy summed up in H-VW-M Platemanship . . . your working guarantee of the best that industry has to offer— not only in plating barrels—but in every phase of plating and polishing.

⊕ 8655

Photo courtesy of H. L. Judd Co., Wallingford, Conn.

For full information on H-VW-M Mercil Type Plating Barrels ask for Bulletin PB-108.

Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

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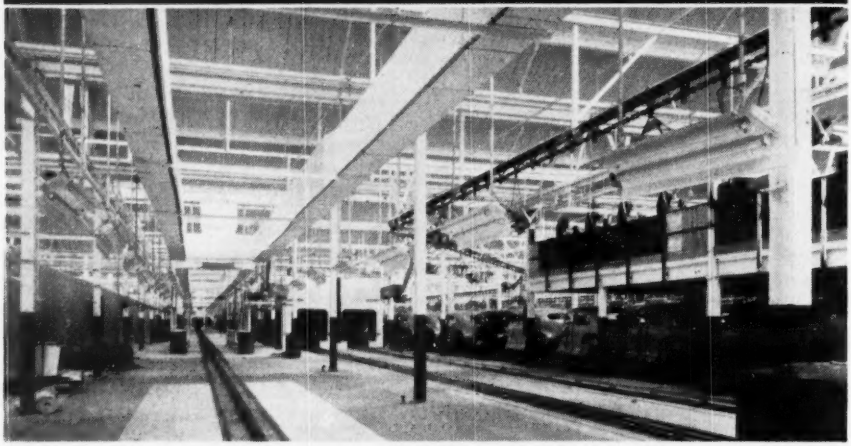
CUT FINISHING COSTS!



WITH A COMPLETE *Conveyorized* FINISHING SYSTEM BY KOCH

KOCH BUILDS:

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- *SPRAY BOOTHS*
- *METAL WASHING EQUIPMENT*
- *COMPLETE FINISHING SYSTEMS FOR BOTH WOOD AND METAL*
- *AIR MAKEUP SYSTEMS*

"Single responsibility"— a two-word symbol of peak efficiency in your system.

KOCH's "single responsibility" insures a perfect dove-tailing of all components, no last-minute changes, no costly extra work.

Let KOCH engineers study your finishing set-up now. Their recommendations may well be the most profitable development of the year for you.

WRITE FOR CIRCULAR 124

GEORGE KOCH SONS, INC.

EVANSVILLE, INDIANA

VOLUME 17 NUMBER 4
JANUARY, 1953

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Products finishing

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Stop costly shutdowns with BLAKESLEE metal parts washers

Niagara Metal Parts Washers furnish the most dependable continuous operation. Consistent performance plus efficient cleaning keeps subsequent finishing lines going. For continuous and batch type metal parts washers you can put your confidence in a Blakeslee engineered product designed for your specific needs.

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OCTOBER 20-24
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BLACOSOLV the highest stabilized degreasing solvent

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SOLVENT VAPOR DEGREASERS in standard or special conveyor models

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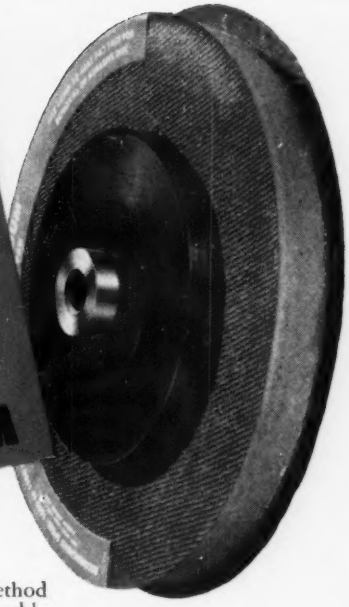
NOW

Wet sanding with discs on the new FASTCUT PAD 85 ASSEMBLY by CARBORUNDUM



Wet sanding with discs—a new, labor saving sanding method—is now possible with the new FASTCUT Pad 85 Assembly by CARBORUNDUM. The 8" diameter FASTCUT Waterproof Paper disc by CARBORUNDUM used with this assembly has many more cutting points than quarter size sheets used in hand sanding, or cut sheets used on vibrating sanders. Thus you can sand a much larger surface in the same time.

With this new method, finger marks are eliminated, giving a better finishing surface. Output per man increases while operator fatigue is lessened considerably. And it's simple to make the changeover in equipment.

Find out all the advantages offered by the FASTCUT Pad 85 Assembly and FASTCUT Waterproof Paper discs—from your CARBORUNDUM distributor, or by sending the coupon.

- **Better finishes in far less time**
- **Increased production at no increased cost**

CARBORUNDUM

TRADE MARK

the ONLY source for EVERY abrasive product you need

MAIL TODAY!

THE CARBORUNDUM COMPANY, Dept. PF 82-37
Niagara Falls, New York

Please send me Engineering Bulletin No. 405 on the FASTCUT Pad 85 Assembly.

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COMPANY

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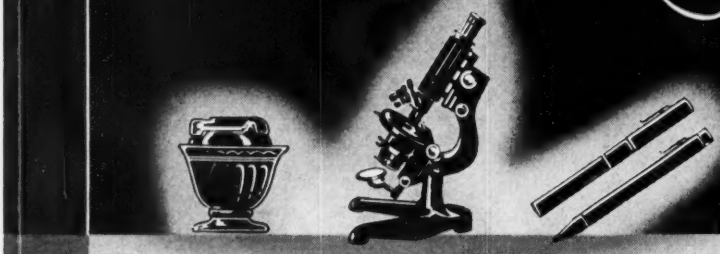
82-37

Rhodium Plating



Rhodium is one of the six platinum group metals. It is hard and has an untarnishable brilliant white color. In electroplating, it produces beautiful results and is widely used for this purpose in jewelry — even precious metal jewelry. Its high reflectivity makes it excellent for mirrors for motion picture projectors and similar purposes. With restrictions upon usual plating metals, rhodium is the logical alternative for plating optical mounts, contacts for communication equipment, radar components, pen and pencil sets and a host of like objects.

Commercial rhodium plating was developed in our laboratories.

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Let us send you "Directions for Rhodium Plating."

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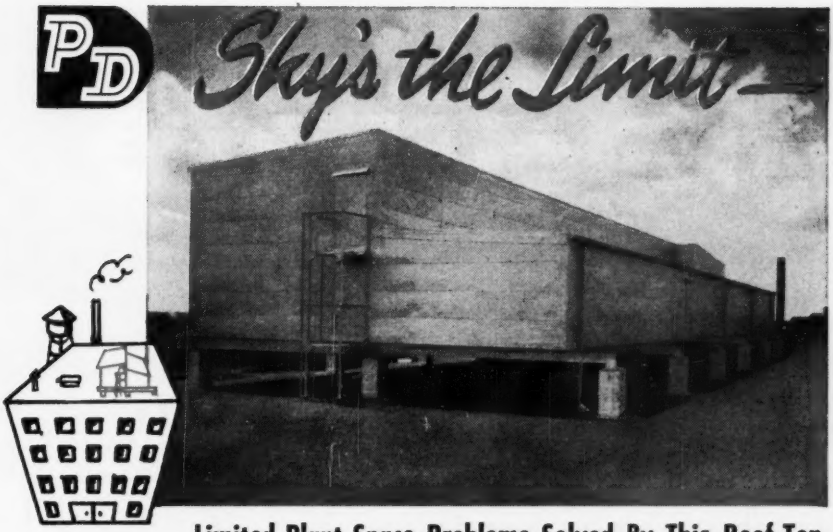

Limited Plant Space Problems Solved By This Roof-Top Installation Of A Peters-Dalton Large Paint Baking Oven

The photograph above is of a recent Peters-Dalton installation. PD engineers solved this manufacturer's problem by meeting his needs for an efficient, cost-saving, Paint Baking Oven without sacrificing valuable square footage within his plant. This roof-top installation with automatic temperature control and especially insulated to prevent heat loss has been engineered to receive painted parts direct from the paint-spray lines.

PD engineering experience and production ability insures thorough analysis of your problems. Any type Paint Drying or Baking Oven designed for your special requirements . . . safeguarding your product's quality . . . giving efficient, economical and trouble-free operation. We'll be glad to tell you more if you — write, wire or phone.

PD *Paint Spray Booths* PD *Drying and Baking Ovens* PD *Dust Collecting Systems* PD *Industrial Washing Equipment*

PD Peters-Dalton INC.

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CORROSION RESISTANT COATING FOR ALUMINUM & STEEL ALLOYS

Lyfanite Coating provides excellent paint bonding properties and resistance to corrosion under Salt Spray and Humidity Tests.

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products for
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LYFANITE-A a Phosphate Coating for Aluminum Alloys meeting Govt. Spec. M.I.L.-C-5541. Ask for Bulletin 52-98.

LYFANITE-Z a Zinc Phosphate Coating for Iron and Steel Surfaces. Conforms to Govt. Specs. JAN-C-490, Grade 1, PA-PD-191, Grade 1, and Spec. U.S.A. 57-0-2, Type 2, Class C. Ask for Bulletin 52-118.

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Announcement

THE SAME SUPERIOR ROBERTS GREASELESS COMPOUND IS NOW STYLED IN ATTRACTIVE ALUMINUM METAL TUBES.

STILL AVAILABLE IN CARDBOARD TUBES TO SUIT CUSTOMER'S CHOICE.
FOR SALE DIRECT OR THROUGH YOUR JOBBER

A COMPOUND WITH YOUR REQUIREMENTS IN MIND

Since 1881

ROBERTS
DISTINCTIVE FINISHING COMPOUNDS

THE ROBERTS ROUGE CO. STRATFORD, CONNECTICUT

• Poloron's Thermaster Portable Refrigerators pass through spray painting booths where they are sprayed with Pittsburgh's Hammerhide Finishes on the exterior. Interiors are finished with gleaming, blue-white baked enamel. Poloron also produces a Woodland model which has Pittsburgh Wrinkle Finish on the exterior.

PITTSBURGH

PAINTS • GLASS • CHEMICALS •

PITTSBURGH PLATE

Picnic Products by Poloron

Are Protected with Attractive

PITTSBURGH FINISHES!

Special Polychromatic Enamels and Wrinkle and Hammerhide Finishes give these portable units added beauty and longer life

● **Since 1928,** Poloron Products, Inc., of New Rochelle, N. Y., has manufactured picnic ice boxes, vacuum jugs and other outdoor items to meet the needs of millions of vacationing and picnicking Americans.

● **Pittsburgh Finishes** have proved ideal in making these unusual products look better and last longer.

● **Poloron's** Thermaster Portable Refrigerators are sprayed with Pittsburgh Hammerhide Finishes. Interiors are finished with gleaming, blue-white baked enamel. Its Woodland model has Pittsburgh Wrinkle Finish on the exterior.

● **Poloron** also produces Woodland feather-weight vacuum jugs in one- and two-gallon sizes, as well as one-gallon Thermaster bottles. The Woodland jugs are sprayed with Pittsburgh's Green Polychromatic Enamel and the Thermaster bottles are coated with Gray Hammerhide Finish.

PITTSBURGH PLATE GLASS CO., Industrial Paint Div., Pittsburgh, Pa. Factories: Milwaukee, Wis.; Newark, N. J.; Springdale, Pa.; Atlanta, Ga.; Houston, Texas; Los Angeles, Calif.; Portland, Ore. Ditzler Color Div., Detroit, Michigan. The Thresher Paint & Varnish Co., Dayton, Ohio. Forbes Finishes Division, Cleveland, Ohio. M. B. Suydam Div., Pittsburgh, Pa.

FREE ADVISORY SERVICE

Poloron Products, Inc., is just one of the many manufacturers with whom Pittsburgh's technical staff has worked to develop highly specialized finishes. This broad experience may be helpful in saving you time and money. Write, wire or phone the Pittsburgh Paint plant nearest you. We'll be glad to have one of our engineers discuss your finishing problems with you at no cost or obligation.

PAINTS

BRUSHES • PLASTICS

GLASS COMPANY

ENGINEERED
SERVICE

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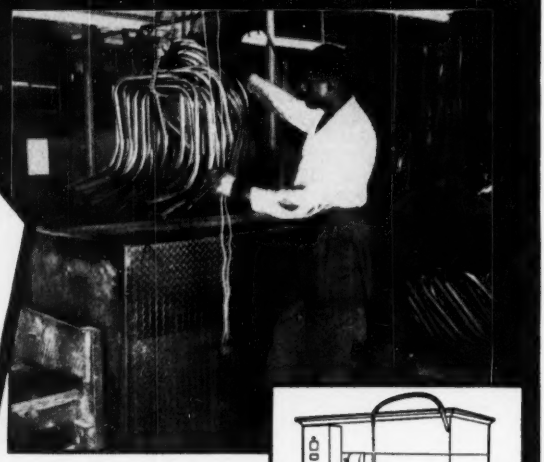
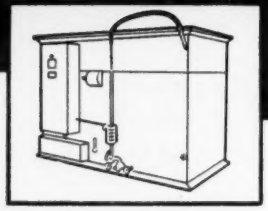
PLATING
RUST-PROOFING
PAINTING





Use PHILLIPS
VAPOR DEGREASING
for Easier, Faster, More Economical Metal Cleaning

NO MATTER what your finishing operations are, you must be sure of perfectly clean surfaces for the best results. Built to operate at the high vapor temperature of 250.2°F, Phillips degreasers assure 30% more cleaning action because more solvent contacts the metal. Industrial processing compounds with relatively high flow points dissolve rapidly and are completely removed in Phillsolv vapor. Automatic thermostat control makes Phillips degreasers reach peak efficiency faster, consume power only when needed, and eliminate waste consumption. Phillips units operate with extra economy, have the greatest cleaning power, and assure chemically clean metal surfaces. Complete line of standard and special models meet all requirements. Check with Phillips today on your metal cleaning problems.

Send for Your Free Copy of New Illustrated Degreaser Bulletin

Phillips

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MANUFACTURING COMPANY
ENGINEERED METAL CLEANING EQUIPMENT

These Manufacturers Have Proved the DEPENDABILITY of

DESPATCH

Engineered

FINISHING SYSTEMS

Space does not permit us to show or even list the hundreds of satisfied users of DESPATCH Engineered Finishing Systems who have proved their dependability with increased production and improved quality, however, the four shown are typical examples.

DESPATCH FINISHING SYSTEMS are designed and built to finish your product better, faster and more economically. They are engineered to fit your particular requirements. You can get a complete system or individual units, such as—

• BAKING OVENS • SPRAY BOOTHS • WASHERS
• DRYOFF OVENS • FLOW COATERS • CONVEYORS
• AIR MAKEUP SYSTEMS

Resident engineers located in your vicinity are ready to help you with your finishing problems.

For More Information Write For Bulletin 51C

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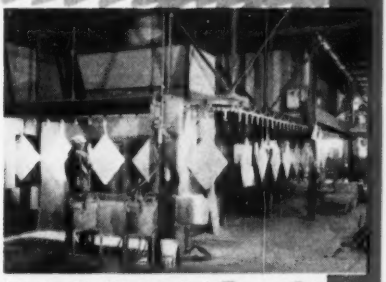
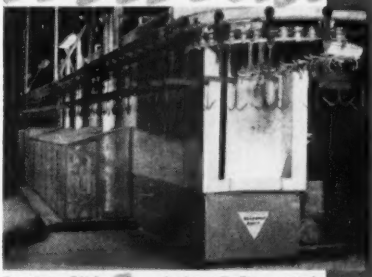
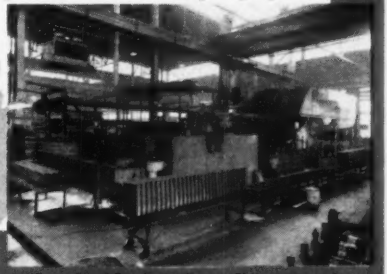


Lyle Sign Co., Minneapolis, increases metal sign production 25% with DESPATCH conveyorized Finishing System.



Bunting Glider Co., Ardmore, Pa., metal furniture makers, gets 4 times the production, no operating cost increases with this DESPATCH Conveyorized Washer and Dry-off Oven.

Atlas Mfg. Co., St. Paul, cuts water costs 25% on furnace casings and boiler jackets with this DESPATCH FINISHING SYSTEM.



Coca Steel Products Corp., Chicago, washes, paints, finish-bakes airplane landing mats on a stepped-up schedule with this DESPATCH Finishing System.

PIONEERS IN ENGINEERING HEAT APPLICATIONS FOR INDUSTRY

News about UNICHROME

Trade Mark

Primer protection for modern metals

Unichrome Primer AP-10 offers the two properties that insure durable finishing of magnesium, aluminum, steel and other metals. (1) Resistance to corrosion even by itself. (2) Strong adhesion even under tough service conditions. That's why it actually improves the life of finish coats. For example: Magnesium panels were primed with AP-10; others with a standard primer. All were given identical finish coats and then tested in salt spray. After 100 hours, panels with Primer AP-10 had developed no corrosion, whereas the others had failed completely.

Remarkable Improvement in Chromium Plating

Hard chromium plating in the Unichrome S.R.H.S. Chromium Solution reduces plating time, control problems, finishing time, and costs. Here's why: This solution plates 20 to 80% faster than the ordinary bath. It plates with less "treeing" and levels over minor surface irregularities. A self-regulating bath, it needs less attention for good results. Impartial tests have also shown that S.R.H.S. Chromium minimizes loss of fatigue strength of chromium plated steel parts.

Florida test shows this

Offers longer

EVEN THOUGH AIR DRYING! EVEN THOUGH HALF AS THICK!

Here's a case history that illustrates the exceptional protection that can be obtained for bright finishes with Unichrome Clear Enamels.

Over 70 coatings for chromium were subjected to year-long Florida exposure tests by a well known company. Most were baking types. Unichrome Coating A-140 was one of the few air-dry coatings. It was applied to a thickness of 0.4 mil, as against 0.8 for the others. Despite this, it was the coating that stood up best by far in the entire test group, being as good as new at the end of the test.

ESPECIALLY NEEDED TODAY

Many bright finishes today are often combination finishes. They retain the eye-appealing advantage of a bright

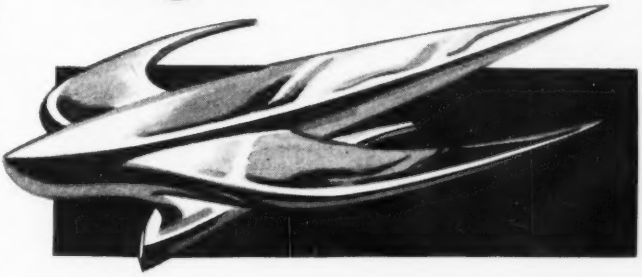
PLASTISOL COATING MAKES IDEAL RACK INSULATION

One particular green, vinyl-base, plastisol coating is being widely used in plating plants wherever racks are worked long and hard. For these reasons: Unichrome Coating 218X doesn't crack or chip even after long service. It resists all plating, cleaning and anodizing solutions and vapor degreasing cycles. It has unsurpassed adhesion when applied over a single coat of Unichrome Primer 219-PX. It minimizes contamination of solutions, rinses freely.

Unichrome Clear Enamel

lasting protection to bright finishes

plate but make use of an organic coating to supplement the corrosion resistance of metallic finishes that do not possess adequate corrosion resistance in themselves. Through their long life, Unichrome Clear Enamels can make a combination finish a *high quality* finish. They offer other advantages, too.



MONEY-SAVING EXAMPLE

Chromium plated refrigerator shelves, for example, require extra protection at the welds. The clear enamel to provide this must resist moisture, handling and corrosives. Using a special Unichrome Clear Enamel, a well known manufacturer is getting not only superior protection but also greater film thickness at less cost than the coating formerly used. Savings reported for the year amounted to $15,000.

GOLD OR BRASS COLORS

Supplied with lightfast color concentrates, Unichrome Clear Enamels simulate gold or brass colors when applied to chromium, bright zinc conversion coatings or polished stainless. The durability of the coatings assures a long lasting finish. Simple control of the color concentrate by the user permits close matching of parts.

★ ★ ★

Among the many Unichrome Organic Coatings developed for both protection and eye appeal, there's probably one to help *you* with your specific problem. Write or phone the nearest United Chromium office.

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Pf editorial

JANUARY, 1953

Vol. 17, No. 4

That They May Help Themselves

In these days of world-wide distribution of American dollars to support the many and various agencies and programs conceived as being beneficial and encouraging to our foreign friends and allies, the announcement (see page 82, this issue) of the establishment of a Battelle Memorial Institute for Germany, as well as a research center in Geneva, Switzerland, is of particular significance.

This "no-cost Marshall Plan" strikes us as being both a wise and generous development. By thus exporting American techniques in organizing and managing an industrial research institute, we are aiding our friends in exactly the area in which they need help—and in this case a private business organization is doing the job at no cost to the American taxpayer. If this act could somehow establish a pattern for our efforts to re-establish or foster the growth of foreign industry, to the end that the economies of other nations would be bolstered, it would represent a milestone on the road to sound international recovery and progress.

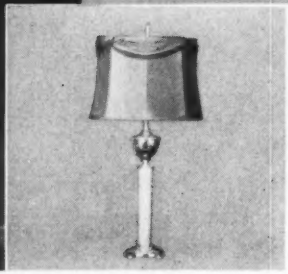
Americans are known (and perhaps hated) all over the world for their wealth, and to a degree, for their generosity, which is not always blended with wisdom and true thoughtfulness.

The Battelle Institute is to be congratulated for its wisdom in thus providing foreign nations with the opportunity for self-help, so that national pride as well as prosperity may be restored.

Ezra A. Blount

—EDITOR

Artistic Finishes on Lamps



Copper, brass, and silver plating, brush finishing, lacquering, enameling, and staining are utilized to achieve the striking finish that is the trademark of the Rembrandt Lamp Corporation.

By FRANK L. BONEM

CHIEF among the sales points of a lamp is the finish which is designed to fit the many styles and characteristics of interior decoration for the American home. At Rembrandt, no less than 650 different designs, ranging from ultra-modern wood enameled table lamps to steel and die cast alloy floor lamps finished in Sheffield silver, are produced to catch the eye of the amateur or professional interior decorator.

Due to the nature of the market and the many different styles of lamps, production is scheduled in job lots of from 6 to 50 pieces. The company produces from 600 to 1,000 lamps per day in its self-sufficient, seven-story plant. Except for the purchase of steel and other basic metals, wood, chemicals, paints, and so on, Rembrandt relies on its own departments, from the creation of a new design to the crating of the finished product.

Departments are located in the building to provide a flow of products from the upper floor to the lower, as follows:

7th floor—design and manufacturing.
6th floor—plating, polishing, buffing.
5th floor—painting and assembly.
4th floor—wire frames, novelty shades, fabrics over paper or plastic materials.
3rd floor—silk shades.
2nd floor—electrical wiring, wrapping, and crating.
1st floor—offices, shipping, and receiving facilities.
Basement—wood working.

Upon creation of a new design, dies are machined on the top floor, or if the shape of the piece dictates casting, plaster molds are made prior to forming steel molds. The machine shop also

makes masking templates for paint finishes, and machines or spin-forms production parts as dictated by the designs.

A comparatively simple setup is also maintained on the seventh floor for producing white metal slush castings. The mould is mounted along the edge of a work bench by means of a bracket which can be rotated. The part is cast with the mould in its normal position. After allowing a brief interval of time to elapse for partial solidification, the mould is turned 180 degrees to allow excess metal, still in the molten state, to flow out. The mould is then returned to its normal position and opened, allowing the casting to fall into water for cooling.

The first step in the finishing process which takes place on the sixth floor, is the degreasing of all metal parts in a Blakeslee vapor and spray degreaser using trichlorethylene. Following cleaning, lamp components are trucked to the polishing and buffing line shown in Figure 1. On this line, each operator has his own complete set of polishing and buffing wheels to obtain the finish specified for the particular part on which he is working. The company sets up its own wheels and uses three progressively higher speeds to obtain a highly polished surface. Buffing compounds are used as specified for various types of finishes.

Following buffing, those parts to be painted are again degreased in the same installation mentioned previously and then moved to the floor below. Parts that are to be plated are cleaned and rinsed; the steel parts in an Oakite cleaner, the white metal cast parts in a Wyandotte cleaner.

Plating Copper, Brass, and Silver

Copper plating is used for either a flash deposit or a thick deposit prior to brass plating. The copper bath and operating conditions are as follows:

Free sodium cyanide	2 oz./gal.
Sodium carbonate	4 oz./gal.
Copper metal	2 oz./gal.
Current density	15-20 amp./sq. ft.
pH	10.2

Brass forms the basis of many types of finishes used on lamps. All steel parts are copper plated as outlined, buffed and brass plated. Figure 2 is a view of the brass plating installation.

The setup for this process consists of seven 500-gallon plating tanks, each

Fig. 1—A view of the long polishing and buffing line.

with its own exhaust hood. Following is the makeup of the plating bath and its operating conditions:

Free sodium cyanide ____2.47 oz./gal.
Sodium carbonate _____5.6 oz./gal.
Copper metal _____3.2 oz./gal.
Zinc metal _____0.6 oz./gal.
Voltage _____2-2.5 volts
Current density _____5-7 amp./sq. ft.
pH _____10.5-10.7

If silver plating is to follow, the lamp components are dried in a steam heated oven held at 160 deg. F. or hand dried in sawdust.

Silver plating is applied to solid brass parts which are first polished and buffed, to die cast parts which are also polished and buffed prior to plating, and to brass plated parts which are buffed with a coloring compound (see Fig. 3). After cleaning, a single silver strike is deposited under the following conditions.

Free sodium cyanide _____6.7 oz./gal.
Silver metal _____0.04-0.05 oz./gal.
Temperature _____room
Current density ____50-75 amp./sq. ft.
Time _____10-30 seconds

The parts are then immersed in a second tank (see Fig. 4) for depositing the heavier plate. Bath constituents and operating conditions for this process are:

Free sodium cyanide ____2.47 oz./gal.
Silver metal _____3.2 oz./gal.
Temperature _____room
Current density ____5-10 amp./sq. ft.
Voltage _____2-2.5 volts
Time _____15-45 minutes

dependent upon the final finish that has been designated for the parts being plated.

The plating installations for silver consist of one 300 gallon tank for the strike, and two 400 gallon tanks for depositing the thicker plate. All baths are filtered weekly using a Lucite disc-type filter, manufactured and develop-

Fig. 2—The two lines of tanks for brass plating. Exhaust hoods remove objectionable fumes.

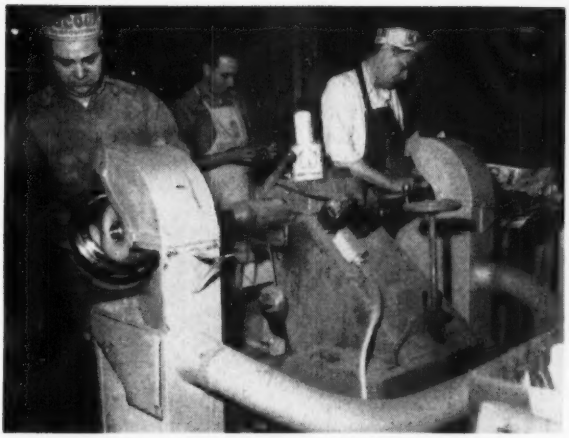


Fig. 3—View of the variable speed polishing lathe on which brass plated parts are buffed prior to silver plating.

ed by Andy Hay, the chemist in charge of the plating department.

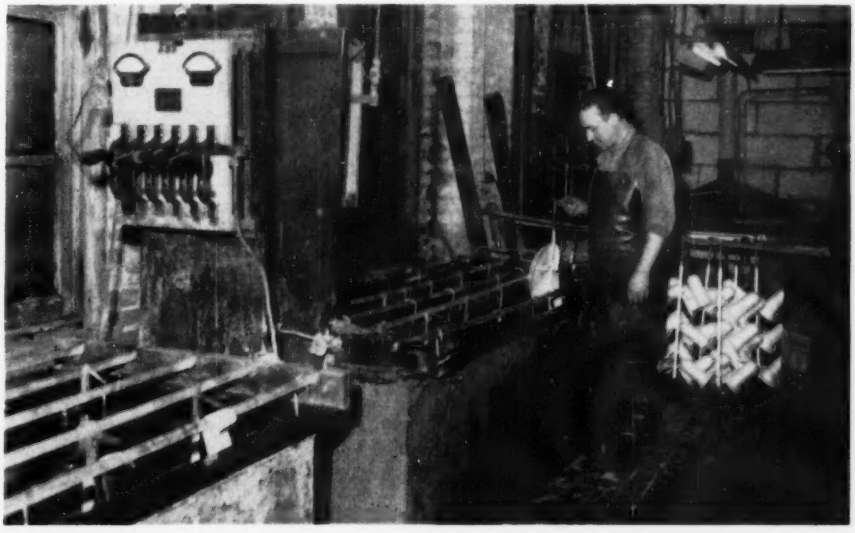
Creating Finishing Effects

Final finishing operations are divided between the sixth and fifth floors; all final buffing, polishing, and clear lacquer dipping being performed on the sixth floor, and all spraying of lacquers and hand brushing for highlighting effects being performed on the fifth floor.

Those parts that have gone through all processes on the sixth floor and are awaiting the last few finishing steps on the fifth floor are temporarily stored in a hot room, to prevent tarnish or discoloration of the finish already applied. This room is kept at 98 deg. F. and a relative humidity of 24 per cent.

Many of Rembrandt's final finishes are effected on brass, this metal being used as a base for gold finish, bronze, or Old English brass effects. Figure 5

Fig. 4—A view of the silver plating installation, showing two of the 300-gallon silver plating tanks.



is a view of the wet brushing installation where steel wire brushes of 0.005-inch diameter wire, turning at 1600 r.p.m., are used to obtain a semi-bright surface on the brass plated parts. For a gold finish, parts are rinsed in water after brushing, dried, and processed as follows:

1. Dip in dichromate.
2. Rinse in cold water.
3. Rinse in cold water.
4. Rinse in hot water.
5. Dip in precipitation thinner to remove water.
6. Repeat step 5.
7. Dip in water-dip lacquer.
8. Dry in steam heated oven held at 160 deg. F.
9. Gold lacquer.
10. Clear lacquer.

For dull brass finish, parts are brushed using No. 240 compound; for a bright brass finish, parts are polished and color buffed. Both finishes are completed by applying one coat of clear lacquer. To obtain a bronze finish, brass plated parts are polished and stained as follows:

1. Wet brush with pumice stone.
2. Stain by dipping in copper sulfate followed by polysulfide.
3. Rinse in cold water.
4. Dry in hardwood sawdust.
5. Dry brush using steel brush of 0.005-inch diameter wire, to obtain a bronze finish effect.
6. Highlight by buffing with pink lime compound.
7. Lacquer.

Three distinct effects are obtained with silver plated parts: a Sheffield finish, a Butler finish, and a regular bright buffed finish.

Parts which are to have a satin finish are buffed with Butler greaseless compound and cleaned prior to plating. After the silver is deposited as previously outlined, parts are brushed in plain water using steel brushes. To obtain a Sheffield finish, the following process is followed:

1. Buff brass plated parts on a soft, loose, 8-inch muslin buff, revolving at 2,300 r.p.m., using a pink lime compound.
2. Clean.
3. Clean.
4. Rinse.
5. Acid dip. For steel, a solution of 50 per cent muratic acid is used; for die casting, a solution of 10 per cent sulfuric acid.
6. Copper plate as previously outlined.

Fig. 5 — Brass plated parts receive a satin finish by wet brushing with steel wire brushes.

Fig. 6—A view of the final coloring operation on a lamp base that is finished in Sheffield silver. This operation takes place in an air conditioned room.

7. Silver plate as previously outlined.
8. Wet brush.
9. Cold water rinse.
10. Cold water rinse.
11. Hot rinse at 180-190 deg. F.
12. Dry in electric oven at 200 deg. F.
13. Color buff using a compound of lamp black and kerosene. Fig. 6 is a view of this operation.
14. Clean in thinner.
15. Cold water dip, lacquer dip, (see Fig. 7).

Buffing, polishing and dip lacquering of silver finished parts are performed in a special air conditioned room to prevent tarnishing or discoloration of the finish.

As previously mentioned, all final lacquering and enameling operations occur on the fifth floor. Gold finishes are effected on brass pieces after assembly, by applying a special formulated reddish tinted lacquer. Lamps are then antiqued or highlighted according to the final finish desired. Some of the finishes thus achieved are all gold, French Gold, English Bronze, bronze, brass, and gold and enamel. A final single coat of clear lacquer is then applied to these lamps as well as to those which are finished in plain polished brass.

Silver finish lamps receive a single coat of clear water white lacquer, specially formulated. On some lamps this coat is followed by a coat of japan, which is glazed to give an antique effect. This is hand applied and wiped as shown in Fig. 8, in a special fixture. This finish is then completed with a

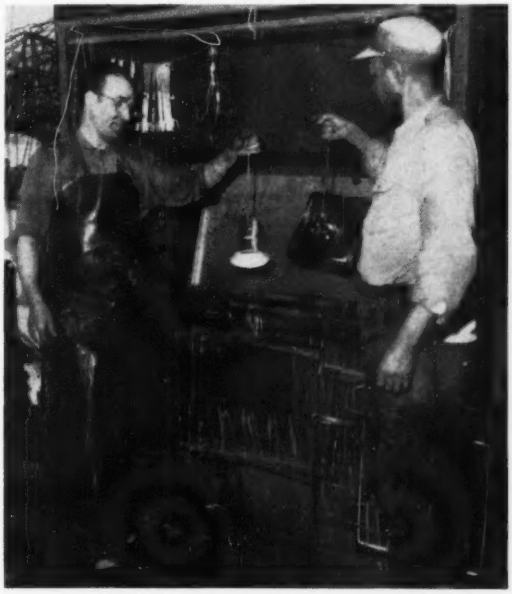


Fig. 7—Silver plated lamp base and light reflector are dipped in cold lacquer prior to being removed from the air conditioned room.

second coat of clear lacquer (see Fig. 9).

Various color effects are achieved with enamels. The steel parts are prepared for enameling by wiping them with Neilson non-toxic etching acid No. 46, which is used in a ratio of 10 to 1 in water.

Light reflectors receive a single coat of white, non-yellowing enamel. Tubing for floor lamps are sprayed twelve at a time and also receive a single coat of enamel in a color which harmonizes with the finish on the other parts.

Many parts of Rembrandt's lamps are painted instead of being plated; others, such as white metal castings, receive a copper flash for better paint adhesion. After cleaning, parts are prepared for painting by the application of lacquer enamel primer. This coat is air dried and the parts are then wet sanded. Two coats of the final coat are applied with spray guns, special preci-

Fig. 8—A silver plated floor lamp is highlighted with japan in this special fixture.

Fig. 9 — Assembled lamp bodies receive the final finishing touch in the form of an overall coating of clear lacquer. The lamps are now ready for wiring.

Fig. 10 — Specially designed masking templates are used to protect the plated portion of lamp parts while the rest is finished with enamel. (*All photos by PRODUCTS FINISHING*)

sion masks being used in order that the plated portions will not be coated (see Fig. 10). Two masks are used for each part, one for each coat. When wrinkle finishes are used, parts are dried in the hot room.

Lacquer or enamel finishes are sprayed in DeVilbiss dry-type spray booths using Type MBC guns. Pressures used vary in accordance with the finish being applied, ranging from 35-60 p.s.i. for air and 10-12 p.s.i. for the fluid.

Miscellaneous parts such as brass sockets and harps are finished by spraying with bronze, silver and gold lacquers, or by being brushed, followed by a color lacquer.

ASTM Standards on Paint, Varnish, Lacquer, and Related Products. Published by the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 800 pages. Illustrated. Paper covers. Price, $5.75.

The Eighth Edition of the compilation of ASTM Standards on Paint, Varnish, Lacquer, and Related Products produced by the ASTM Committee D-1 covers more than 200 subjects, tests, and definitions issued by the Committee, as well as related standards from other committees.

Material covers standard specifications for pigments (white, black, blue, metallic, and so forth); drying oils, paint driers, and thinners; shellac, varnish, and varnish materials; naval stores; lacquer and lacquer materials; traffic paint, bituminous emulsions; paint tests, putty, and paint weathering tests.

This new edition embodies numerous revisions of existing specifications and tests, and much new material prepared since the previous edition (1949). There are 23 new standards included: 16 are methods of test, 6 are specifications, and one covers forms for reporting results of exposure tests for paints.

Let's Take the Mystery Out of Paint Application. By Lee Turner. 30 pages. Price, $5.00.

The author, in this field report on paint application problems, stresses the value of the following four factors:

1. Paint temperature control at the mixing and cutting point.
2. Temperature control at the point of application.
3. Atomizing pressures.
4. Training of paint spray personnel.

The publication covers paint application methods in detail and presents recommendations as to optimum conditions for the formation of the most desirable finish.

The role of elevated paint spraying temperature is described completely in nontechnical language. The functions of the various elements in the formulation of a paint or lacquer are outlined, and adjustments required to correct finish defects are listed.

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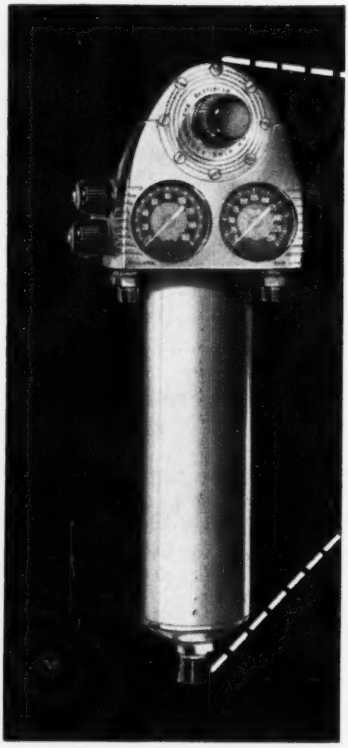

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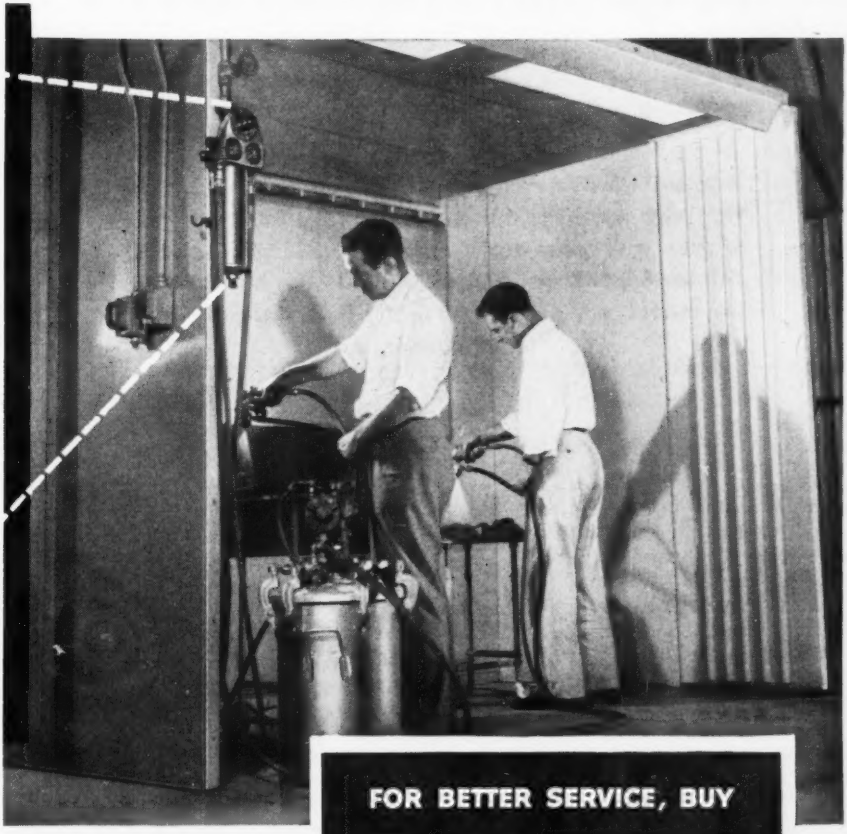

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Vacuum Metallization of Plastics

Vacuum Vapor Plating of both metals and plastics with metal coatings, describing general techniques and possible applications, is described in this article. Lacquers, as well as the actual coating metal, are employed to produce the completed product.

By DR. GEORGE BANCROFT
Consolidated Vacuum Corporation,
Rochester, New York

THE application of a metal finish to thousands of different articles made from a wide variety of materials, by vaporization of the coating metal under a high vacuum and condensation of the vapor on the pieces to be plated, is a technique that is rapidly gaining prominence among industrial product finishing processes.

Manufacturers of toys and costume jewelry probably are the principal users, but other products on which metal finishes are being deposited by evaporation under vacuum range all the way from automobile and household appliance escutcheons, to perfume bottles and sports trophies, lamp reflectors and special sun goggles.

Essentially, high vacuum metallization is simply a matter of getting air molecules out of the way, so that the vapor from a metal that has been heated to the vaporization point can travel unimpeded from the molten source to the article to be coated. This process has been made possible by the development, in recent years, of so-called oil diffusion vacuum pumps, by which relatively large enclosures can be pumped down to a pressure of less than ½ micron—approximately 1/1,500,000 of an atmosphere pressure—quickly and economically. It is only in high vacuums of that order that vaporization and deposition of metals are successful.

There are a number of reasons for the burgeoning interest in high vacuum metallization. It is clean, involving no chemicals or solutions, and emitting no fumes. Unit production per worker is high, and skill requirements are low. Cheap materials are satisfactory for many uses. Only exceedingly small amounts of metal are used, so restrictions on consumption of critical materials have little, if any, effect on the

process. All those factors combine to keep the high vacuum metallizing process highly economical.

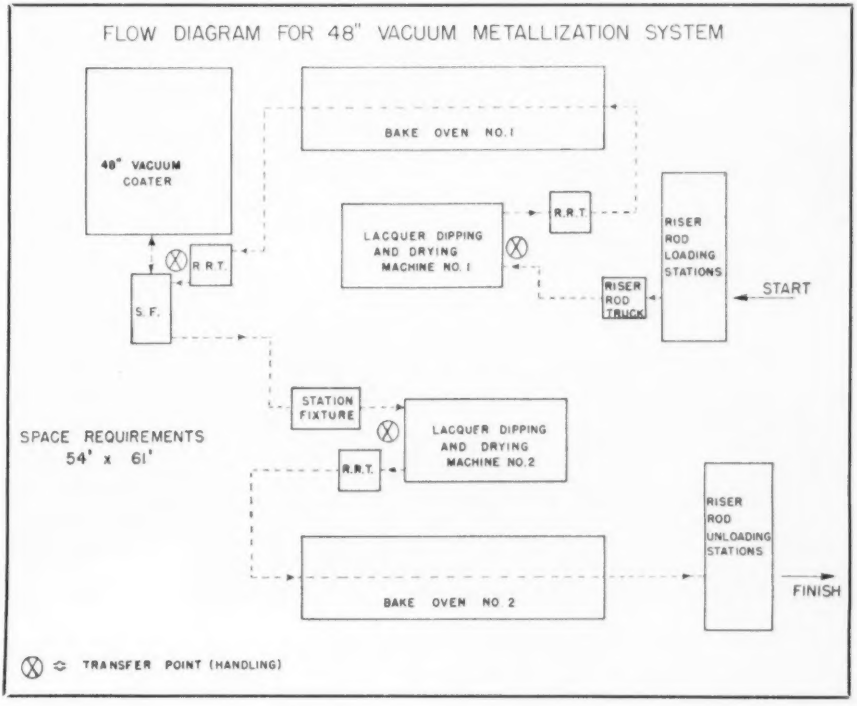
Any non-porous material is satisfactory as a base to receive the metal coating. Acrylic resins, acetates, and the cheaper base metals are widely used, and polystyrenes are coming into the field.

Coating Process Operations

In operation, the vacuum coating process generally consists of three steps. Most products require an undercoat of lacquer, usually applied by dipping. The reason for the lacquer coat is to smooth out surface irregularities which might be made conspicuous by the thin metal film, to seal microscopic porosities, and to prevent any galvanic action between the base material and the metal coating. Following dipping, the lacquer coat must be baked, to ensure the complete removal of volatiles, and care must be taken to select a lacquer that will not, upon ageing, decompose and migrate to the surface, causing a defect in the metal finish. Also, it is necessary to select a lacquer of the proper type to give good adhesion to the base material. For instance, some lacquers will adhere well to acetate, but not to polystyrene.

After proper preparation, the articles to be coated are placed in a vacuum chamber, in the center of which are located a number of tungsten filaments, on which are hung "hairpins," or small loops of the metal that has been selected for the coating. The vacuum chamber then is evacuated, and,

Figure 1.



when the required degree of vacuum has been achieved, a high-amperage current is applied to the tungsten filaments, heating them so that the metal "hairpins" hanging on them quickly melt. In the absence of air, the molten metal vaporizes, the vapor travels outward in straight lines from its source, and condenses on the first cool surface with which it comes in contact. Thickness of the condensed metal film is controlled by varying the current applied to the filaments, and the period of the heating portion of the cycle.

In applications in which complete, all-around coating of the articles is desired the pieces are mounted on rotating jigs which turn slowly while the metal is being evaporated, exposing all sides of the pieces to the metal vapor. If only one face is to be coated, as in the case of lamp reflectors, escutcheons, or similar articles, the jigs can be stationary.

The number of pieces that can be coated in a single cycle is, of course, determined by the size and shape of the article, and the size of the processing unit. The vacuum unit in most common use for the metallizing process is a chamber 48 inches in diameter, and having "riser rods," or jigs, 48 inches long. In such a unit it is possible to arrange about 2,500 pieces, approximately 3 inches in diameter, in a single load. An efficient assembly of three or four vacuum pumps of both the mechanical and oil diffusion types is capable of pumping that chamber down to the required vacuum in less than 20 minutes, so that a production rate of 7,500 pieces per hour is possible.

Aluminum is by far the most popular coating material, because of its high

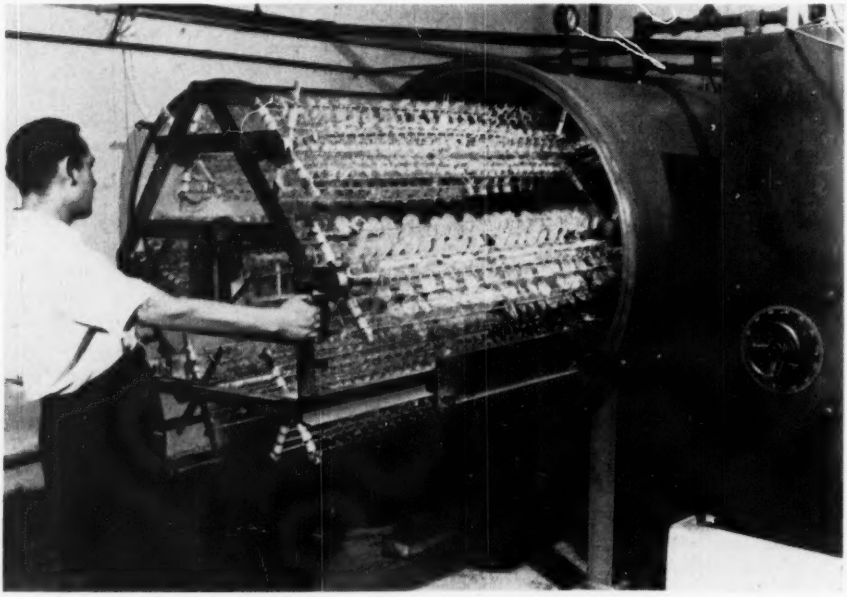
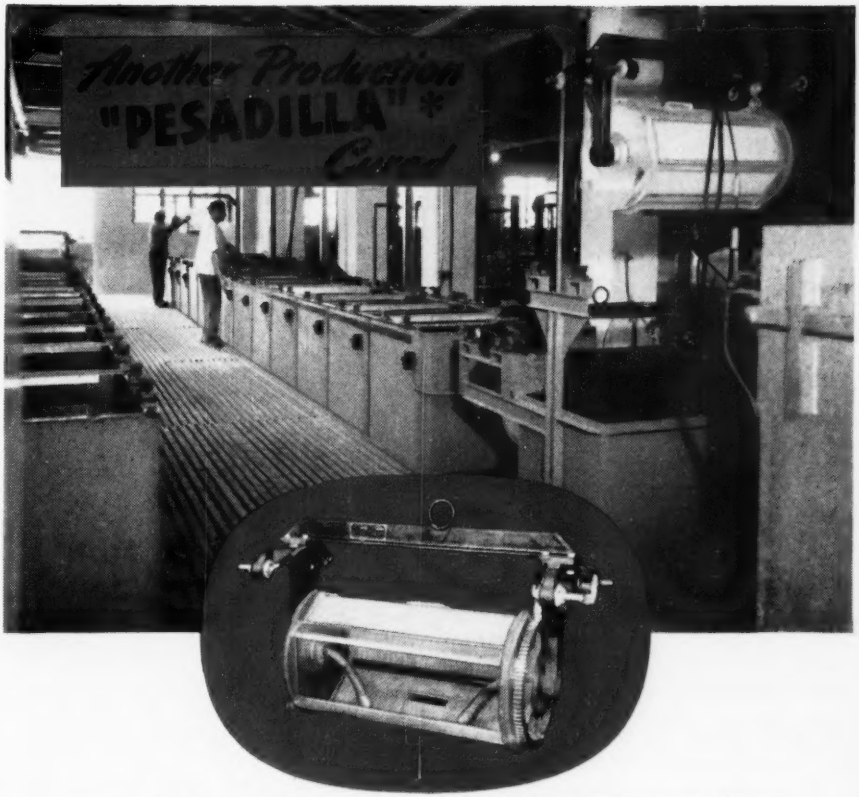


Fig. 2—Illustrative of the type of equipment used for vacuum metallizing is this view made in the plant of the Boyd Products Company, New York City. A jig frame bearing decorative pins is being withdrawn from a Stokes Air-Tight Vacuum Metallizing Chamber.
(Photo courtesy F. J. Stokes Machine Co., Philadelphia 20, Pennsylvania)



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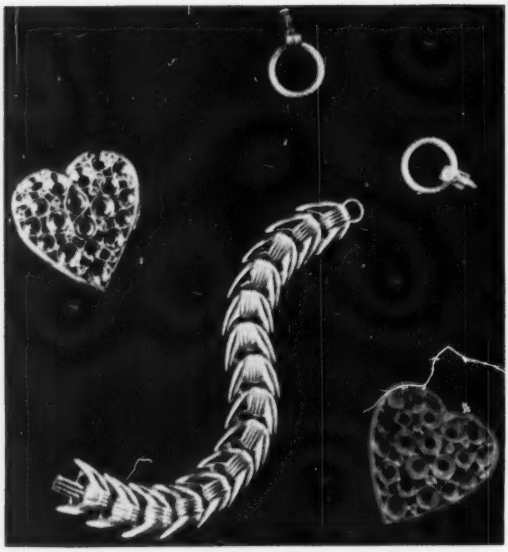

Fig. 3—Metal casts both before and after finishing by vacuum metallizing. An unfinished pin is shown in the lower right hand corner of the illustration; the other jewelry items having been finished by a deposit of evaporated metal. *(Photo courtesy F. J. Stokes Machine Co., Philadelphia 20, Pennsylvania)*

reflective qualities, and physical properties which make it especially suitable for the high vacuum metallizing technique. Aluminum, when molten under vacuum, wets the tungsten heating elements, thus providing a large surface, uniformly distributed, from which the metallic vapor emanates.

Since the coating of metal applied by the high vacuum evaporation process is an extremely thin film of the order of a few millionths of an inch in thickness, in any uses where it will be exposed to abrasive or corrosive wear it must be protected against those forces. That usually is done by applying another coat of lacquer.

The outer coat of lacquer can be clear, or it can be dyed virtually any color of the rainbow. The high reflectance of aluminum makes it possible, by using the proper dyes, to give the finished product a realistic-looking gold or copper appearance, or to produce articles that match or harmonize with any decorative scheme. Colored door knobs, drawer handles, and other kitchen hardware designed to fit the housewife's color plans, are among the latest applications of vacuum metallizing.

In many applications in which the base material is a clear, transparent plastic, the metallic coating is applied to the back surface, so that the plastic itself serves to protect it against abrasive wear. Usually, however, even in those uses, a coat of lacquer is put on over the metal as an added safeguard. A number of automobile escutcheons, refrigerator name plates, and other similar articles are made thus.

Metallizing Film. A new 16 mm. sound film in full color, recently completed by Metallizing Engineering Co., Inc., 38-14 Long Island City 1, New York, describes the metallizing process and shows a wide range of practical applications as reported by many users throughout industry. The film opens with the observation that most industrial maintenance men would profit from a tour of plants throughout the nation, but since that is impractical, the film has been designed to do a thorough reporting job in its place.

Included among the applications for corrosion protection are storage tanks, bridges and trestles, degreasers, and other steel work. One sequence shows the crack streamliner of the Missouri-Pacific, the "Sunshine Eagle," with 85,000 square feet of underframes sprayed with pure aluminum for protection against corrosion. Power capacitor cases are shown being sprayed with pure zinc, a process that has replaced paint for many years on the Westinghouse production line.

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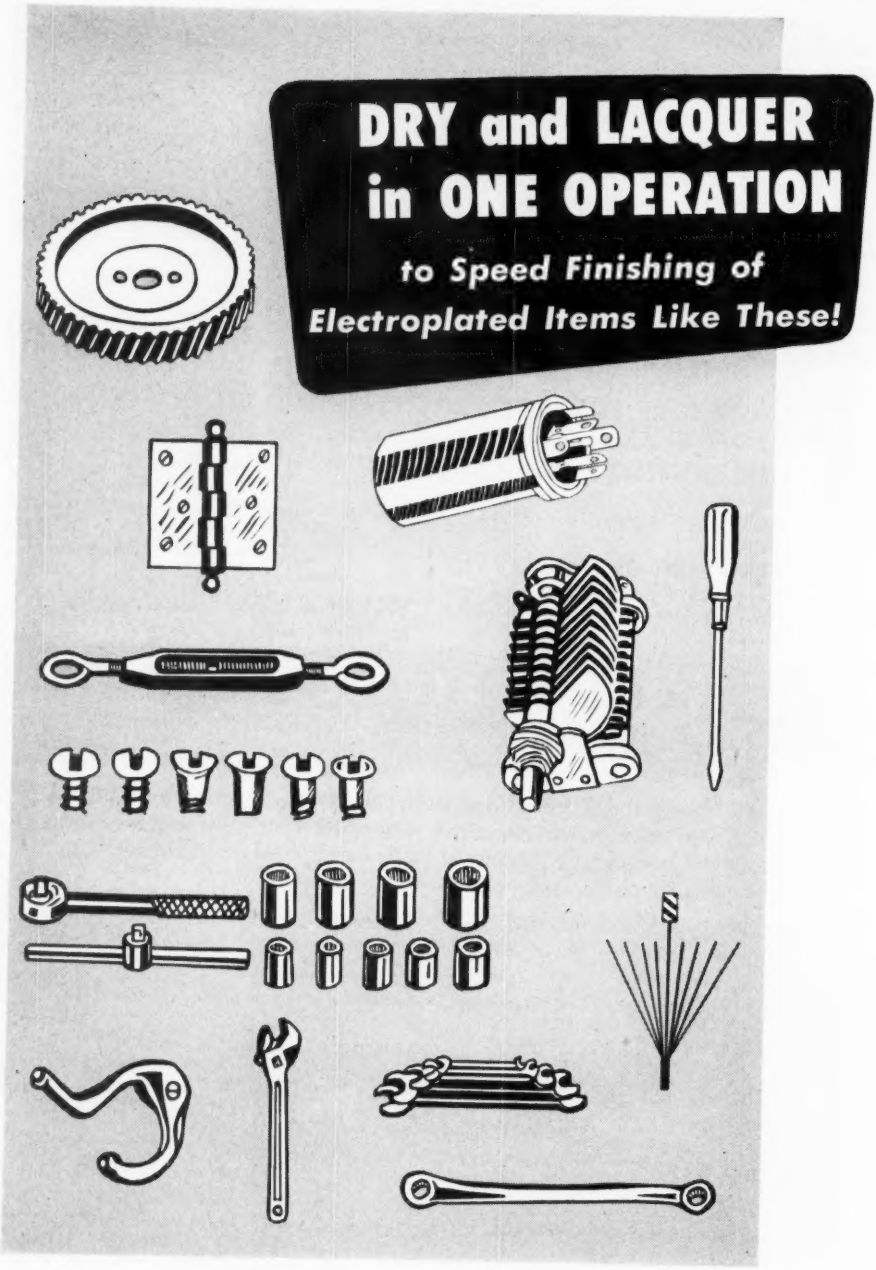
DRY and LACQUER
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to Speed Finishing of
Electroplated Items Like These!

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EGYPTIAN WATER DIP LACQUER

Because Egyptian Water Dip Lacquer is especially formulated to displace moisture from electroplated surfaces, enthusiastic manufacturers finishing small steel, aluminum, brass, cadmium and zinc articles are reaping the benefits of stepped-up finishing room production.

"ONE OPERATION" Egyptian Water Dip Lacquer makes practicable the passing of small electroplated pieces from the final plating rinse directly to the dipping basket or rack. Troublesome, time consuming sawdust pile and other drying processes are completely circumvented.

Egyptian Water Dip Lacquer's efficient instantaneous moisture displacement action insures against stains or water spots . . . dries to a hard, highly adherent, practically water white, tarnish resisting finish in ten minutes at room temperature.

Egyptian "ONE OPERATION" Water Dip Lacquer may be just what you need to speed small product finishing in your plant.

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This Coupon will bring an Egyptian Specialist with all your answers.

The EGYPTIAN LACQUER MFG. CO.
P. O. Box 444, Newark 1, New Jersey

Please have an Egyptian Industrial Finishing Specialist call on me soon. I would like to know how Egyptian Water Dip Lacquer can cut my Finishing Costs.

Name ..... Title .....

Company Name .....

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City ..... Zone ..... State .....

Finishing Clinic

In this department are presented some of the questions submitted by readers together with suggested solutions of the problems outlined.

Question. *We manufacture a product using bows, as shown on the attached sketch, made of ¼-inch and ⅜-inch galvanized iron pipe. These bows are used to support a convertible top used on outboard and inboard boats.*

We are confronted with a number of problems in developing an economical and satisfactory method of painting these bows and the situation is complicated by the fact that available space in our plant is limited. Further, our anticipated requirements may not exceed two or three thousand bows during a year, making it impractical to install a mechanical setup for painting. Because of limited floor space, whatever finish we use must be fast drying. We would, of course, like a finish that is durable over the galvanizing.

Last season we sprayed the bows with lacquer. It appeared that we used an excessive amount of lacquer, and we were unable to produce a good finish on damp days. We will appreciate it if you will recommend to us the method and materials that you believe would serve our purpose best.

W. H. T.

Answer. Your problem seems to have three elements; namely, adherence, material used, and speed of drying or application method.

For improved adherence you might like to consider one of the phosphate treatments used on galvanized iron surfaces to improve the paint finish adherence. The names of several companies supplying these materials are enclosed.

For material with the best drying characteristics, you might like to contact one of the eight companies whose names are listed here. (company

names and addresses supplied).

It is possible that you would find the use of an infra-red drying setup most satisfactory from every standpoint. Information concerning drying equipment of this type may be obtained from any one of the companies listed (names of four companies furnished).

Further, you should consider the advantages of the hot spray lacquer process. Information concerning the process and the equipment used in accomplishing the job may be obtained from the companies listed here (names of five companies listed).

———— *fc* ————

Question. *We are silver plating parts fabricated from rectangular brass tubing, approximately ½ x 1 x 8 inches to 12 inches long. Some of these units are closed on one end by means of a brass plug soft-soldered into the tubing. Others are open all the way through. Many are curved or bent. Our plating process for these parts involves going directly into the silver strike, then the silver plating solution from the cleaning cycle, omitting a copper flash. We are experiencing some trouble with silver adherence to the exposed solder at the plug and also with full silver coverage in the inside of the plugged tubing.*

We wonder if you could suggest a method to eliminate these troubles. We also wonder if a copper strike on these parts may be desirable. —*R.S.S.*

Answer. Your problems of silver adherence to the exposed solder and poor coverage on the inside of the tubes are not unusual.

Please refer to the attached tear sheets of the article, "Repairing and Silver Plating Valuable Antiques," published in the December 1949 issue of PRODUCTS FINISHING, for information on proper silver plating technique. Of course, to secure coverage on the inside of tubes, a special or separate anode should be used. This is quite standard practice and your plating foreman can no doubt apply the technique. Just use another "inside" anode on a flexible wire.

There appears to be no justification for a copper strike in your process.

———— *fc* ————

Question. *We manufacture metal photo frames made from brass. At present we clean the brass, then plate gold or silver over this, and finally apply lacquer to prevent tarnish. As soon as our present supply of brass is gone, we will have to use steel. Could you be of help to us in advising the best way in which we might finish our photo frames when we have to substitute steel for brass?* —*K.E.E.*

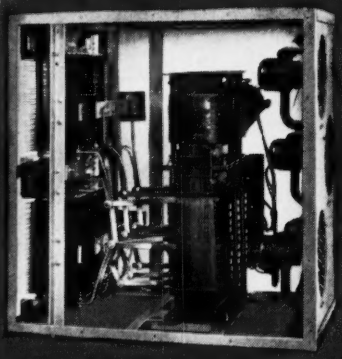
Answer. There are several possibilities which you might like to consider in the solution of your problem. One possibility is the application of copper plating over the steel, followed by a thin nickel flash, after which you might gold or silver plate and lacquer as usual.

Another finishing system which might be satisfactory would be the treatment of the steel with a phosphate or chromate corrosion-resistant coating, followed by the application of a metallic lacquer of the shade and brilliance desired in your product. We are supplying you with the names of a number of companies supplying materials which you could use in the second suggested solution to your problem.

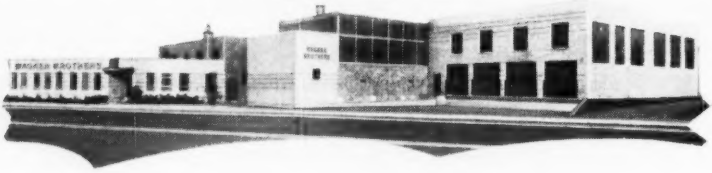
DO YOU HAVE A FINISHING PROBLEM?

The editorial staff of PRODUCTS FINISHING is prepared to aid you in the solution of your problem.
There is no charge for this service.

ELECTRO-PLATING REQUIREMENTS *from* ANODES



WAGNER-TIEDEMAN RECTIFIER with back panels removed showing easy access and simplicity. Note three low velocity cooling fans.



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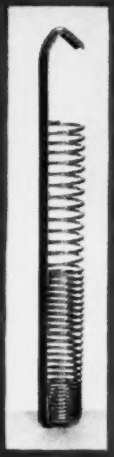

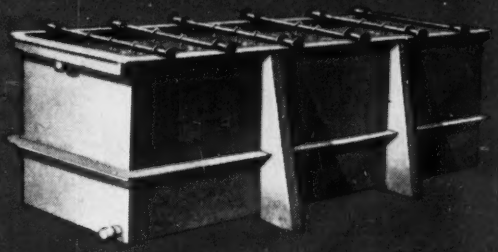

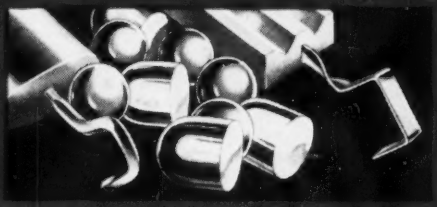

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Spotlighting FINISHING Progress

Recovery and Treatment of Plating Wastes

By DR. ALLEN G. GRAY

RECOVERY of plating wastes may be feasible at lower costs than disposal, and in some cases recovery may even show a profit. This was the keynote of a talk on recent developments in the disposal of plating wastes presented by Dr. Louis Weisberg, consultant, before the Boston Branch, American Electroplaters' Society. There is little doubt that the easiest, cheapest, and most efficient plating waste control procedure is to minimize the amount of waste produced.

Dr. Weisberg stated that there are three methods available for recovery of plating wastes: improved method of rinsing, termed countercurrent washing; evaporation; ion exchange.

A countercurrent washing layout is shown in Fig. 1. It consists of four tanks in series, with water entering the last tank, so that final washing is done with the cleanest water. Table I lists compositions in four-compartment countercurrent recovery plating rinse tanks, as percentage of composition in the plating tank. Dr. Weisberg pointed out that so far as rinse compartments are concerned, less than three seldom pays, while in most cases more than four rinse compartments are not justified. The countercurrent washing system has the advantages that minimum water is required for washing, a high concentration of recovered waste is pro-

A Monthly Digest of Current Technical Progress Indicating Significant Trends and Developments in the Finishing Industry

AMERICAN CHEMICAL PAINT COMPANY
AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet
Subject: PROTECTING ALUMINUM WITH ALODINE®

ALODIZING IS EASY AND EFFECTIVE

The Alodizing process is a chemical one and does not require electrolytic techniques or equipment. Alodizing is simple, foolproof, low in cost, and requires a minimum of equipment. Essentially, the process consists of the following easily controlled operations or steps:

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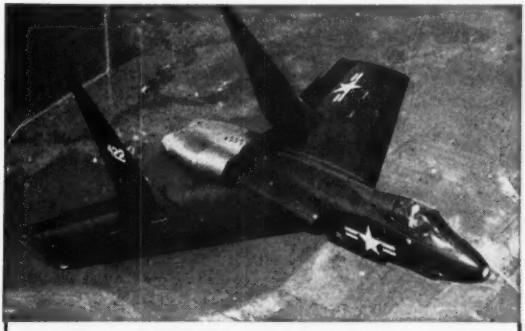
2. Rinsing the cleaned aluminum surfaces
3. Coating with "Alodine"
4. Rinsing with clean water
5. Rinsing with acidulated water
6. Drying

After treatments. Alodized aluminum provides an ideal bonding surface for paint, wax, adhesive, or other organic finishes. These should be applied in accordance with the manufacturer's directions. Unpainted or exposed areas will be protected by the tough, durable "Alodine" surface.



Flight of the Chance Vought Cutlass, seventh in a line of outstanding fighters and "potentially capable" of flying faster than any other service type jet aircraft in production, land or carrier-based. Substantial surface areas of the Cutlass are constructed of painted Alodized aluminum.

FAST COATING TIME

With the "Alodine" bath at its normal temperature of 120°F., coating time by immersion approximates 1½ minutes and by spraying, 15 to 20 seconds. Coating times and bath temperatures can be varied to suit operating conditions.

"ALODINE" HAS UNLIMITED APPLICATIONS

Parts can be treated by immersion, by spraying in an industrial washing machine, by flow coating, or by brushing. This means that "Alodine" can be used anywhere, on any part or product made of aluminum. This has led to widespread use of the Alodizing process: 1. by fabricators of aluminum products in all industries to assure the utmost in product protection and finish durability; 2. by manufacturers of aluminum who are supplying Alodized aluminum sheets and coils from the mills.

In general, small size products or parts are processed rapidly and conveniently in immersion equipment, which can be mechanized if production volume justifies it. For large production of formed parts, or for Alodizing coiled stock, strip, or cut-to-size sheets, a five-stage power spray washer is most convenient. Airplanes, trucks, trailers, housing, railway cars, bridges and other large units are Alodized in a simple brush-on or flow-coat process.

"Alodine" applied by immersion or spray complies with the rigid performance requirements of MIL-C-5541; MIL-S-5002; 16E4 (SHIPS); U.S. Navord O.S. 675.

CHEMICALS ACP PROCESSES

WRITE FOR FURTHER INFORMATION ON "ALODINE" AND YOUR OWN METAL PROTECTION PROBLEMS

CHEMICALS ACP PROCESSES

duced, and it is a relatively inexpensive setup. Table II shows percentage recovery of cyanide in a four-stage countercurrent recovery rinse system.

One countercurrent washing performance variable, discussed by Dr. Weisberg, was the ratio of wash water feed to plating solution carry over. Tables I and II give data for water feed ratios of 5, 10, and 20. Regarding agitation, these data show that for good mixing the composition of carry-over is the same as the composition in the tank. For half-mixing, which is really bad mixing, composition of carry-over is the average of that in the two preceding tanks. Figure 2 shows a low temperature vacuum evaporation and countercurrent washing layout recommended for cyanide recovery. Countercurrent washing followed by evaporation can be used for cold chromium (or nickel) plating solutions. Countercurrent washing without a separate evaporator takes care of hot chromium (or nickel) plating solutions.

Ion Exchange Methods

According to Dr. Weisberg, ion exchange methods are especially suitable for chromic acid recovery with simultaneous removal of foreign positive ions. Applications cited were as follows: aluminum anodizing, with simul-

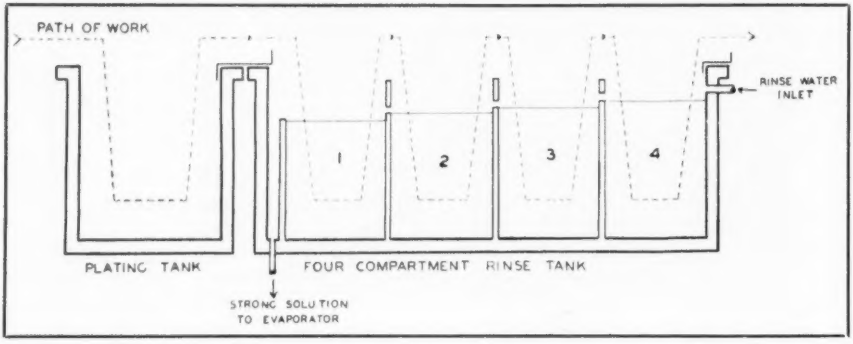
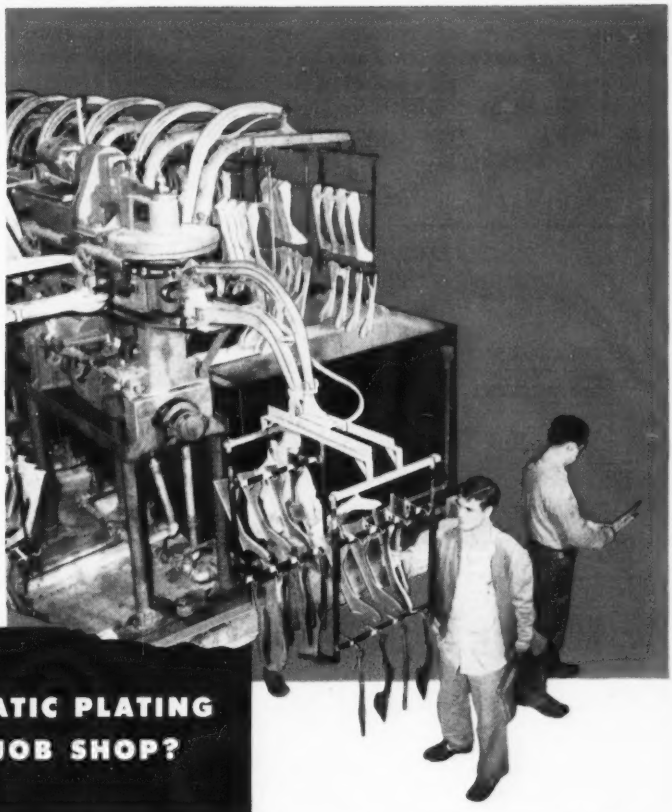


Fig. 1—Countercurrent recovery rinse system for plating.
(Courtesy Dr. Louis Weisberg)

Table I

COMPOSITIONS IN FOUR COMPARTMENT COUNTERCURRENT RECOVERY RINSE (AS PERCENTAGE OF COMPOSITION IN PLATING TANK)

	GOOD MIXING			HALF MIXING		
WATER FEED RATIO	5	10	20	5	10	20
COMPARTMENT						
1	20 %	10 %	5 %	19.6%	9.9%	5 %
2	4	1	0.25	11.6	5.4	2.6
3	0.77	0.1	0.012	2.7	0.71	0.18
4	0.13	0.01	0.0006	1.0	0.26	0.06



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Detroit Plating Industries has four Stevens machines in operation. Three are full automatic rack type, and one is a Stevens Automatic Barrel machine. With this equipment, Detroit Plating Industries get precise control of plate thickness – they handle a diversified group of products – and they can quickly shift from one order to the next.

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taneous recovery of chromic acid, removal of excess aluminum and trivalent chromium, and pH control in electrolyte; zinc conversion coating solutions with simultaneous recovery of chromic acid, removal of excess zinc and trivalent chromium, and pH control; chromic acid solutions for stripping copper, where recovery of chromic acid and separation of copper and

Table II

PERCENTAGE RECOVERY OF CYANIDE IN FOUR STAGE COUNTERCURRENT RECOVERY RINSE

	GOOD MIXING			HALF MIXING		
WATER FEED RATIO	5	10	20	5	10	20
COMPARTMENT						
1	80 %	90 %	95 %	40 %	45 %	47 %
2	96	99	99.8	84	92	96
3	99.2	99.9	99.98	93	97	98.6
4	99.8	99.99	99.999	98	99.5	99.9

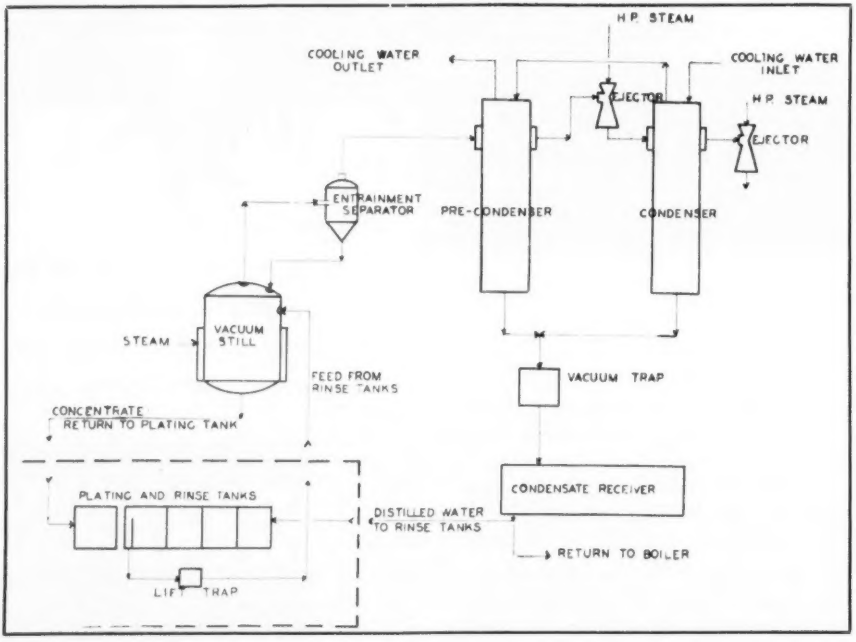

Fig. 2—Vacuum evaporation and countercurrent washing layout for cyanide recovery suggested by Dr. Louis Weisberg at the 16th Annual Technical Meeting of the Boston Branch, A. E. S.

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trivalent chromium for possible recovery is achieved; recovery of chromic acid from rinse waters of every description. One point brought out was that chromic acid solutions attack ion exchange resins if too concentrated or too hot (usually safe up to about 12 oz./gal. and 150 deg. F.). This can be overcome by diluting chromic acid before it goes through the ion exchanger, and concentrating by evaporation afterwards.

Cation Exchange Treatment for Chromic Acid

At the Sixth Industrial Waste Conference, held at Purdue University, D. M. Stromquist and A. C. Reents, Illinois Water Treatment Company, described methods used for removal of metals from chromic acid solutions. The method of treatment suggested for the removal of the undesirable metallic ions from chromic acid was by cation exchange, using a cation exchange resin on the hydrogen cycle. The advent of the styrene divinyl benzene type cation exchanger, which is stable under conditions of acidity, alkalinity, oxidation, and temperature opened up possibilities for this type of work. This material was reported to be relatively stable in chromic acid solutions up to 20 to 27 oz./gal. chromic acid, but decomposed when exposed to higher concentrations.

Treatment of chromic acid solutions, in tests reported by Stromquist and Reents, was performed in tubes ranging from one inch in diameter to four inches in diameter with bed depths approximately 30 inches. The resin employed in all cases was the styrene type of cation exchanger. The resin was regenerated by percolating 20 to 25 pounds of 66 deg. Be' sulfuric acid per cu. ft (10 per cent solution) through

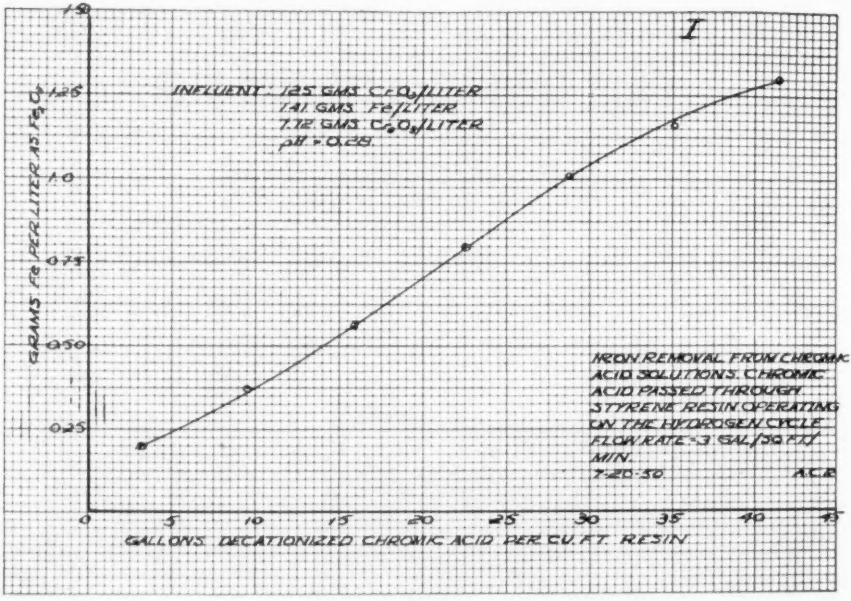
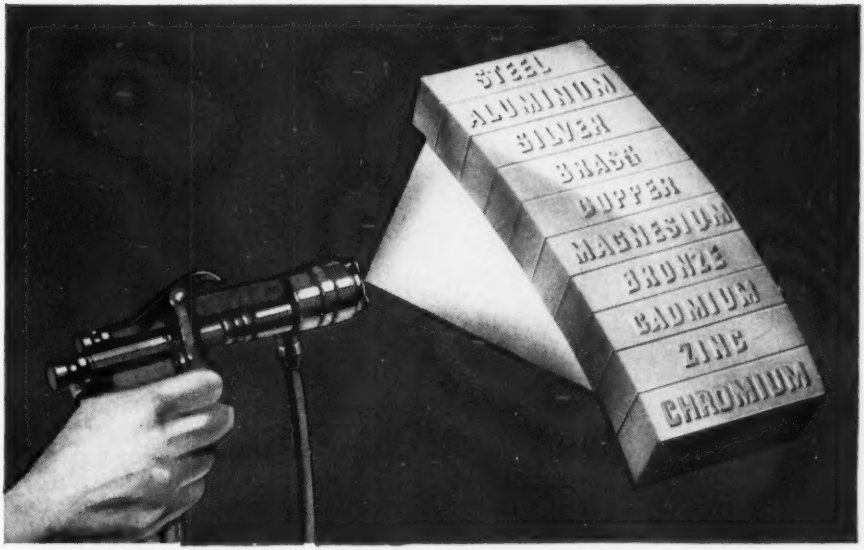


Fig. 3—Iron removal from chromic acid solutions passed through ion exchange resins—flow rate equals 3 gal./sq.ft./min.



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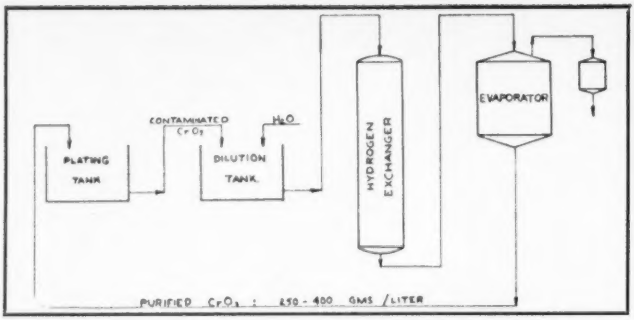

Fig. 4—Flow diagram for purification and concentration of chromic acid for reuse in plating bath. (*Described by D. M. Stromquist and A. C. Reents at the Purdue University, Sixth Industrial Waste Conference*)

the resin bed.

The first work performed on the purification of chromic acid was done to determine at what concentration the chromic acid could be treated successfully without excessive resin oxidation. For example, a portion of chromic acid plating bath containing 44.5 oz./gal. chromic acid, 0.928 gm./l. iron, and 14.49 gm./l. trivalent chromium, plus small amounts of other contaminant metals, was passed through a regenerated bed of the styrene type exchanger, and aliquot samples of the effluent were tested. The first portions gave evidence that only 30 per cent of the ion was removed. The exhaustion point was reached quickly, indicating that the pH of the raw material was so low that effective exchange could not be accomplished. In addition, the resin was attacked, as indicated by the increase in trivalent chromium concentration of the effluent, rather than the expected decrease. Additional work showed that minimum oxidation occurred at concentrations of 70 to 100 gm./l. chromic acid. The most complete exchange was also obtained in this concentration range.

Figure 3 gives the results of a typical purification run at a chromic acid concentration of 125 gm./l. showing the removal of ion from the solution. The ion was present initially to the extent of 1.41 gm./l. There was also 7.72 gm./l. of trivalent chromium in the solution. Although removal is not quantitative, the contaminate ion is reduced sufficiently so that the acid is once more usable. In this case, the flow rate through the exchange material was held at three gal./sq. ft. per minute. In another test, trivalent chromium was added to the extent of 2.95 gm./l. to a previously purified chromic acid bath containing 70 gm./l. CrO_3 for the purpose of determining trivalent chromium removal from chromic acid by cation exchange. A composite sample of the effluent indicated that 60 per cent of the trivalent chromium was removed during the run.

Data given by R. L. Costa,[1] Mutual Chemical Company, on regeneration of chromic acid solutions by cation exchange show that in a simulated chromium plating bath containing 400 gm./l. (53.6 oz./gal.) CrO_3, 25.0 gm./l. cupric oxide, and 28.6 gm./l. ferric oxide, 75 per cent of the dissolved metals were removed when the solution was diluted to 150 gm./l. CrO_3. At 100 gm./l. CrO_3, almost quantitative removal of the metals was obtained and the ultimate capacity of the resin was about 12.5 grams cupric oxide and 14.3 grams ferric oxide per liter of resin.

In decorative chromium plating the dragout may be sufficiently great so that contamination of the bath itself

[1] R. L. Costa, Ind. Eng. Chem. *42*, p. 308 (Feb. 1950).

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Table III

MATERIAL COSTS FOR PURIFICATION OF ANODIZING BATH USING ION EXCHANGE METHODS — BASIS—ONE PURIFICATION CYCLE

Item	Cost
Chemical Cost (H_2SO_4, 66° Be' at $0.015/lb. using 1200 lbs.)	$18.00
Resin amortization, based upon a useful life of 250 cycles	11.40
Equipment amortization, based upon twelve cycles per year, ten year life	51.40
Direct labor, four man hours, $1.80/hr.	7.20
	$88.00

Value of recovered CrO_3: 2000 gal. x 8.34 lbs. per gal. x 99% recovery x .30 cost per lb. = $496.

(Based on data presented by D. M. Stromquist and A. C. Reents at the Purdue University, Sixth Industrial Waste Conference)

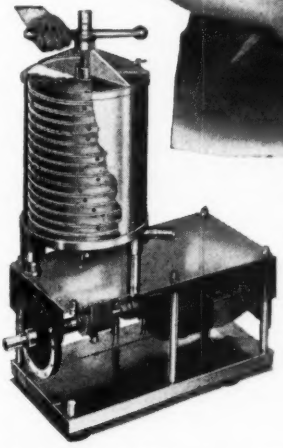
is very low, that is, the dragout and subsequent chromic acid makeup exceeds the speed of contamination. In this case the contamination is transferred to the rinse bath. It is possible to let the concentration of the rinse baths build up to a nominal figure, as well as the metal contaminants, and then purify the rinse bath by cation exchange. The material as treated is quite dilute, when considering the working concentrations of the plating baths. Evaporation to the desired concentration, using a layout such as is shown in Fig. 4, may be used to get the recovered material in condition to add to the bath. Also, a combination of a hydrogen exchanger and an anion exchanger can be used to recover chromic acid from the rinse water. Here again evaporation is desirable to concentrate the chromic acid recovered.

Purification of Anodizing Solutions

Chromic acid anodizing baths are made up in concentrations ranging from 75 to 150 gm./l. CrO_3. As a result, most of these baths can be treated by cation exchange for aluminum removal without prior dilution. It is possible to run an anodizing bath up to an aluminum contamination concentration of 12 gm./l. aluminum oxide (Al_2O_3), but then the bath must be adjusted by dumping or by drawoff and partial makeup. When the aluminum contamination reaches this limit, purification by cation exchange may be considered. Another method is to withdraw each day a portion of the bath and treat it by cation exchange; thus, the bath may be permanently maintained at maximum efficiency.

Test results reported by Stromquist and Reents showed that in the case of a 100 gm./l. chromic acid anodizing bath containing 6.94 gm./1. of aluminum oxide, the aluminum concentration during the ion exchange purification was held to less than 0.02 gm./l. To illustrate the cost for purification of anodizing baths, Stromquist and Reents presented the data summarized in Table III. This anodizing bath contained 2,000 gallons of solution (100 gm./l. CrO_3) and alumina in the amount of 10 gm./l. The bath was decationized by a single batch treatment. The cation exchange resin was regenerated with 66 deg. Be' sulfuric acid diluted to a concentration of 10 per cent, and used in the amount of 25 lb./

guard against Rejects



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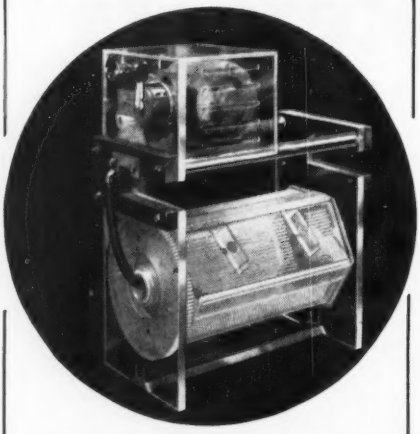

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cu.ft. of which 15 lb./cu. ft. was recovered. The resin required for this recovery unit would be 120 cu. ft. of styrene type cation exchanger.

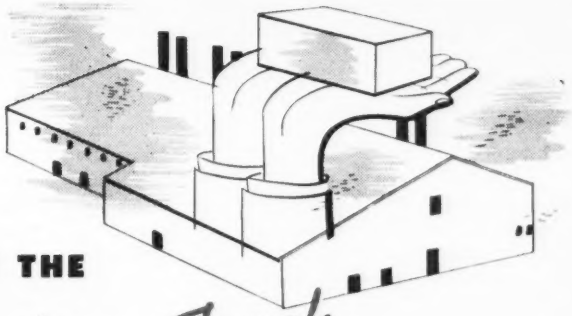
Treatment of Chromium Wastes with Sulfur Dioxide

Reduction of hexavalent chromium with sulfur dioxide or sulfites is being used as a practical method for disposal. At a pH of 2.0-2.5, sulfur dioxide reduces hexavalent chromium to trivalent chromium. The trivalent chromium is removed as insoluble chromium hydroxide by precipitation with caustic soda or lime.

According to data made available by Wallace and Tiernan, Newark, N. J., the treatment of chromic acid wastes by this method may be accomplished either in a "flow-thru" or "batch" type of treatment plant. In a typical "flow-thru" plant, the chromium wastes flow to a holding tank. If sulfur dioxide is to be used, sulfuric acid is applied to the waste as it enters the tank in an amount sufficient to maintain a pH of 2.0-2.5, controlled either manually or automatically. Slightly more sulfuric acid is required if sodium sulfite or metabisulfite is used instead of sulfur dioxide. Under these conditions, the sulfuric acid is applied near the point of sulfite application and the pH of the waste is controlled, manually or automatically, to 2.0-2.5 beyond the point where the sulfite is thoroughly mixed with the waste.

After the addition of sulfur dioxide, the pH of the reduced chromium waste is adjusted to about 8.5 by the addition of lime slurry or caustic soda to precipitate trivalent chromium hydroxide. The precipitated chromium hydroxide can be allowed to settle out following which it may be drawn off as a sludge.

As a part of his discussion on plating waste recovery before the Boston Branch, A.E.S., Dr. Weisberg pointed out that the economical recovery point



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lies between 95-98 per cent in most cases. The balance has to be disposed of by chemical treatment. For chromic acid, reaction with sodium bisulfite or ferrous sulfate was suggested. For cyanide, treatment with chlorine or high test hypochlorite was recommended.

Cyanide Disposal After Plating Cycle

Another feature of the Purdue Sixth Industrial Waste Conference was a description of a method for treating cyanide for disposal in the cycle of a plating machine. This method, whereby a cyanide disposal plant is literally attached to a plating machine, is in use on an automatic zinc plating operation at Delco-Remy Division, General Motors Corp., Anderson, Ind. According to C. F. Hauri, plating engineer at Delco-Remy, who described the operation before the Waste Conference, the cyanide is treated as soon as it becomes a waste by alkali chlorination in the rinse tank.

Approximately 1,500 square feet of surface area are processed in the zinc plating unit each hour. There are two reclaim tanks, the first of which is run empty so that plating solution can drain from the work tumbling therein, the other contains water that gradually builds up in cyanide content until such time as it is returned to the plating tank, when it is again filled with water. Tests on the rinse tank overflow following these two reclaims showed 200 to 400 p.p.m. sodium cyanide with a 15 g.p.m. water flow.

It was decided to try chlorination of this rinse water following the two reclaims. The rinse tank was altered so that it would be suitable for the treatment procedure by making the following changes; suitable ventilation was added; a bottom outlet was provided for connection to the chlorinator intake; a sump was provided for the re-

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turn feed of the chlorinator in the rinse tank and overflows thereto to cause diffusion and to house the elec-

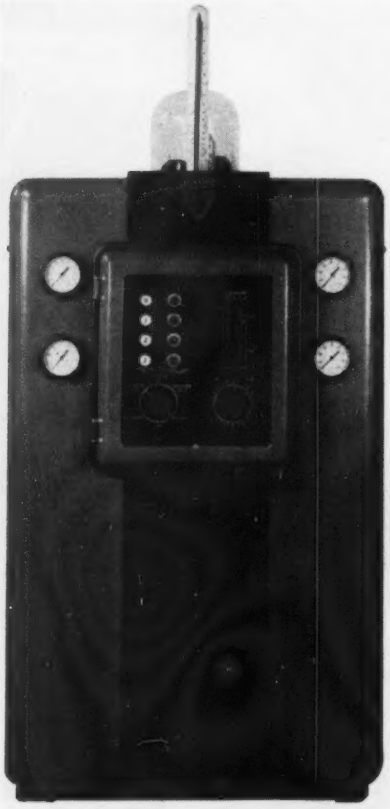

Fig. 5—A program controlled chlorinator produced by Wallace & Tiernan that can be used in cyanide treatment for disposal.
(Courtesy Wallace & Tiernan Co., Inc., Newark 1, New Jersey)

trodes of the pH meter; and a pump was installed in the inlet line to the chlorinator. Equipment secured to operate the disposal process consisted of one 100 lb./day commercial chlorinating machine, one 600 gal./hr. circulating pump, and an indicating pH meter. Fig. 5 shows a program controlled chlorinator produced by Wallace and Tiernan that can be used in cyanide treatment.

In discussing the details of the disposal operation at Delco-Remy, Hauri pointed out that the rinse water is pumped from the tank to be chlorinated through the injector of the chlorinator. The flow is greatly restricted while passing through the orifice of the injector and the resultant vacuum draws the chlorine gas into the stream and also results in a great turbulence which helps in dissolving the chlorine. The stream, after passing through the injector, is returned to a diffuser placed in the sump of the rinse tank. This sump also contains the electrodes of the pH meter equipped with an alarm and visual indicator.

The treatment operation is continuous since the water in the tank is being constantly recirculated during the operation. Fresh water is added to the rinse tank at a rate of about 1 gal./min. so that a like amount overflows continually to the sewer. Before the equipment was in operation, it was thought that the chlorination of the rinse could proceed for perhaps four hours followed by discard to the sewer and recycling. Experience with the equipment actually in operation was the basis for the decision to allow an overflow of one gallon a minute by the addition of fresh water, thus theoretically replacing the solution every two hours. This makes it unnecessary to discard batches and results in less down time for the plating operation.

The chlorine feed can be adjusted from 0 to 100 pounds a day, with 80 pounds a day being commonly used. Alkalinity is adjusted by adding caustic soda to maintain a pH of 8.5 to 10. About 2 pounds per hour of caustic are used. The amount of chlorine used is based on that needed to maintain free chlorine in the sump. A test for the presence or absence of free chlor-

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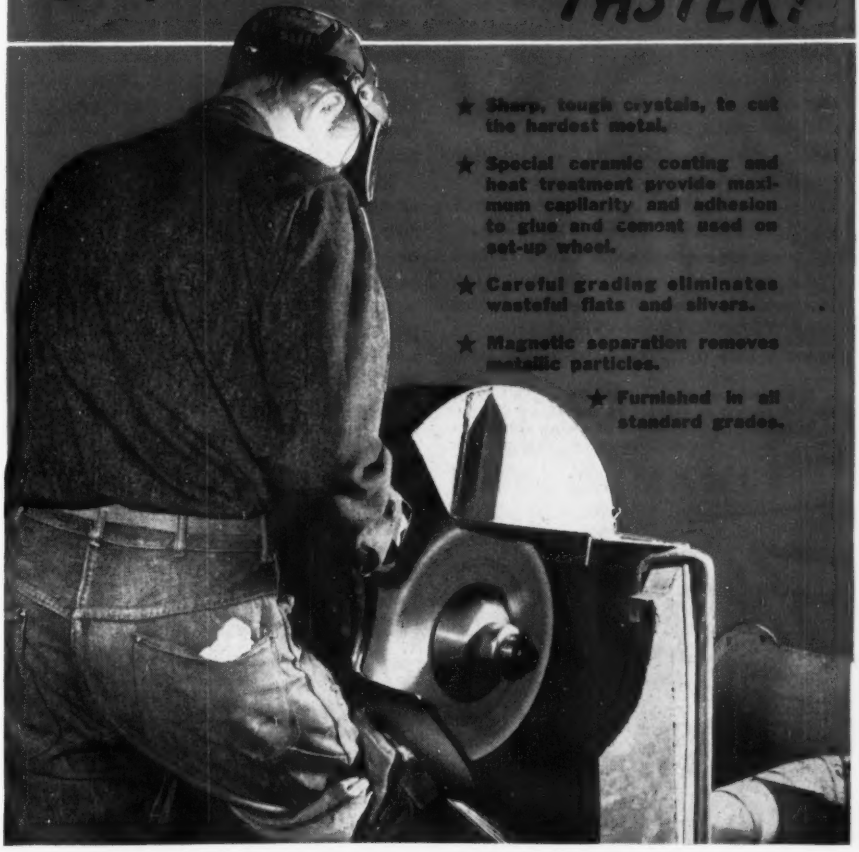
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ine can be made at the plating machine by taking a 100 ml. sample from the treatment tank, adding one or two drops of methyl orange indicator solution (avoid an excess), and stirring. Disappearance of color indicates presence of free chlorine. The pH must be in the range of 8.5 to 10 for this test. The chemical cost of operation of this disposal system was reported to be about 50 cents per hour.

Minimize Dragout Losses To Simplify Waste Treatment Problems

Chemicals salvaged for re-use do not need to be removed from waste water. This point was emphasized in a report on plating room controls for pollution abatement prepared[2] by the Ohio River Valley Water Sanitary Commission. In line with this principle, work removed from a plating tank should be allowed to drain back into the bath unless such practice interferes with the quality of processing. In moving forward from a processing bath, any solution necessarily remaining on the work should be rinsed in a still water or save-rinse tank. This rinse water should be returned to the processing tank. Save-rinse tanks are necessary for any system, particularly if the operation does not allow thorough work drainage.

The extent to which concentrations of metal salts build up in the save-rinse solutions should determine the number of rinses to be employed. Another important consideration in determining number of rinses is design of parts being processed. It has been suggested that save-rinse facilities should be designed so that the concentration in the last rinse tank does not exceed 5 per cent of that of the processing bath. While it may be true that opera-

2 "Plating-Room Controls for Pollution Abatement." A report prepared by the Metal-Finishing Industry Action Committee of the Ohio River Valley Water Sanitary Commission (1951).

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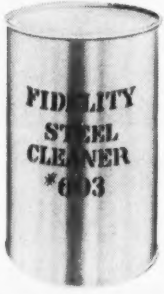

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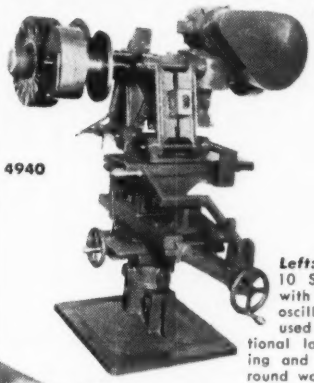

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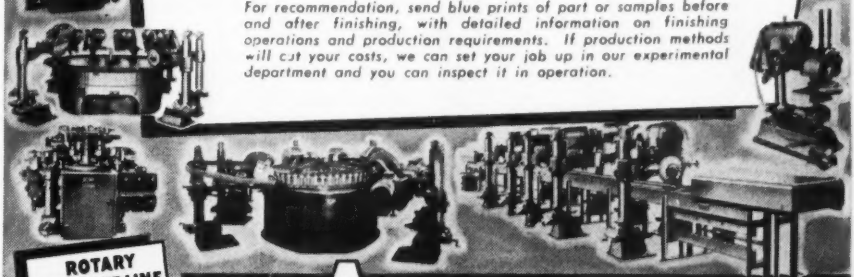

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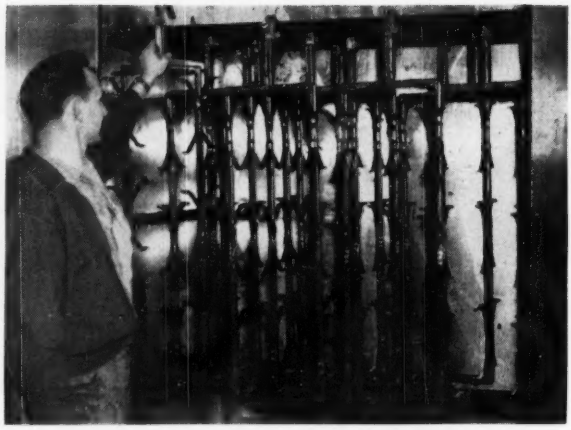

Fig. 7—Plating racks coated with plastisol Unichrome Coating 218X being placed in a bake oven. *(Photo courtesy United Chromium Inc., New York 17, N. Y.)*

tion of a number of rinses may incur added labor costs in the finishing department, additional labor is also required to run a waste treatment plant. Reduction in dragout and elimination of all other incidental losses of plating materials automatically reduces the amount of waste discharged from the plating room.

* * *

Vinyl Plastisol Coatings

COATINGS from vinyl plastisols contain no volatile solvents and consequently heavy deposits can be made in one application. In discussing the engineering properties of the vinyl plastisols recently in "Product Engineering," John Delmonte pointed out that such materials consist of finely divided polyvinyl resins dispersed in a phase of liquid plasticizer and stabilizer. There are no volatile constituents present in these dispersions. The coating can range from a soft, rubber-like consistency to a firm texture.

The usual procedure for applying vinyl plastisol coatings is to heat the parts to be coated to the temperature of gelation, or slightly higher, and then immerse them in the vinyl plastisol. There will be an immediate gelation of the coating on the surfaces of the part. This is followed by reheating at about 350 deg. F. to complete the cure of the coating. Additional layers may be applied by the same procedure. Coating thickness will depend upon the viscosity of the plastisol and on the heat capacity of the part being coated.

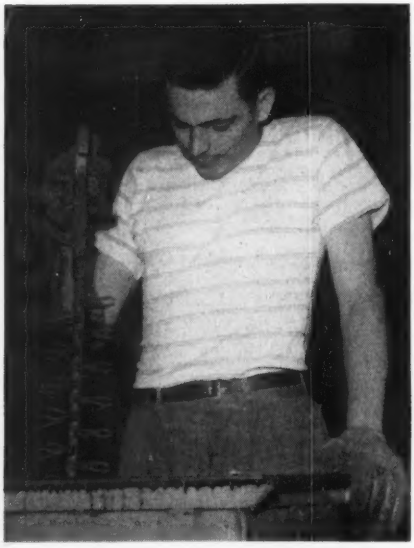

Fig. 6—Plating racks being dipped into a tank of Bunatol No. 1002 paste insulation. *(Photo courtesy Nelson J. Quinn Co., Toledo 7, Ohio)*

to page 66→

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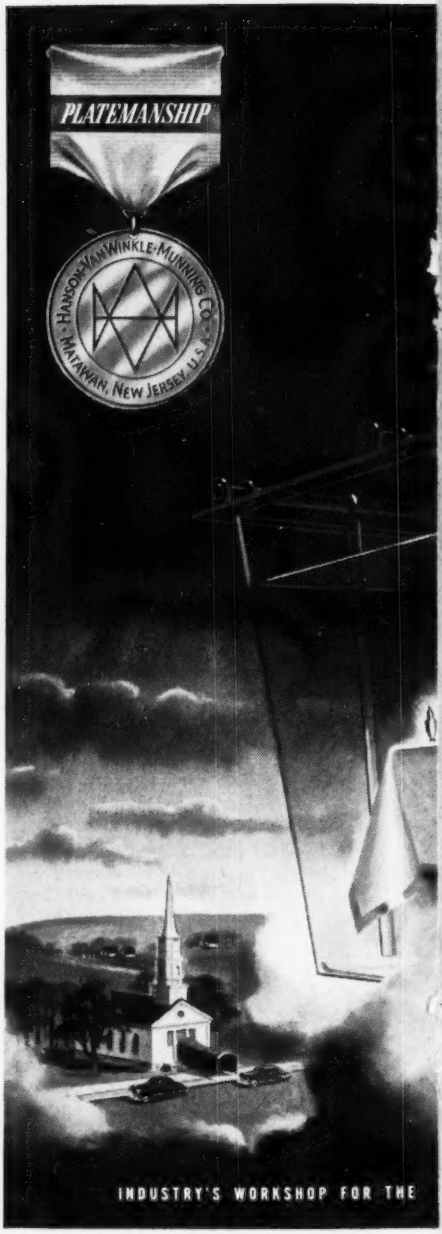

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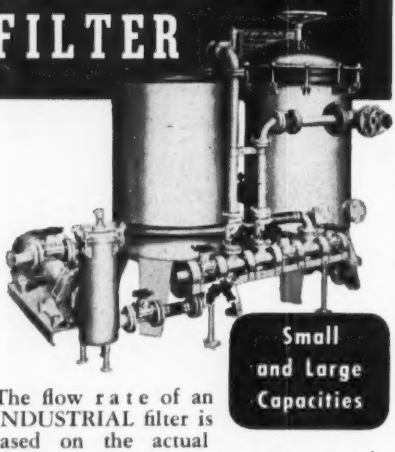

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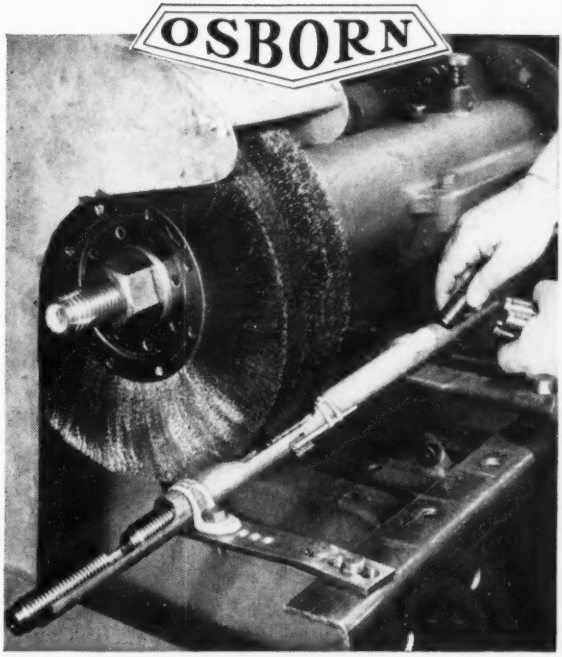
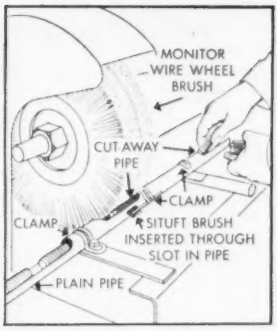
Notebook Atoms. Fisher Scientific Company, 717 Forbes Street, Pittsburgh 19, Pennsylvania, recently announced its notebook-size simplified Periodic Chart.

For individual use, this is a small 8½ by 11-inches, inexpensive chart for personal study and reference. It permits the reader at his seat in a large lecture hall, to follow a discussion of the periodic arrangement of the elements from his own Notebook Chart. Later, when he opens his books for study, he has an exact miniature reproduction of the chart.

Credit for the useful information on Simplified Charts goes to a very large number of chemistry professors and instructors who took part in a comprehensive survey. With this back drop of pertinent data, Simplified Charts were prepared in two colors presenting information essential for most basic study and laboratory work.

The chart has a four-place logarithm table on the reverse side. Also there for convenient reference is an electromotive force table of the elements with the respective ions. Printed on substantial white stock, the chart is punched to fit a three-ring binder.





THE FIXTURE. This sketch shows how to make pipe fixture for deburring and polishing small parts, threaded or smooth. Can be made of steel, fiber or plastic tubing.

How to find an 800% production increase in a piece of pipe

You can save manpower and money in countless ways when you tap the idea resources of power brushing. For example:

It took 18 seconds to clean the threads of the 2½ x ¼-inch set screws shown above. Time was cut to 2 seconds with Osborn Power Brushing by devising the simple pipe fixture shown. The operator feeds the screws in one end of the pipe and an Osborn brush makes contact with the work at a slot cut in the pipe, spinning and cleaning the threads uniformly. A little stationary wire brush, inserted as shown through the pipe, controls rotation and traverse of the work.

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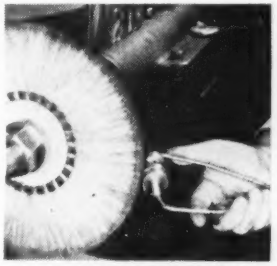
TYPICAL PARTS. Set screws, pins, pieces of tubing and other parts such as these can be cleaned and finished in the pipe fixture or in the forceps shown below.



ANOTHER SIMPLE APPROACH. For small parts such as bushings, a simple forcep fixture can be devised to hold parts for power brushing. This one is made of wire.

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Marketing-minded manufacturers, more and more, are realizing that "one good name deserves another"—that the Sherwin-Williams name, allied with their own trade-mark, contributes the added sales appeal of the best-known name in finishes. There's no easier way to say, "This is a quality finish" to so many people, so quickly.

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INDUSTRIAL FINISHES

Practical Applications of modern products

Unit Heaters Provide Air Circulation In Paint Drying Oven

THE reduction of paint drying time by 25 to 30 per cent was recently accomplished at the J. I. Case Company, well-known manufacturer of farm machinery of Racine, Wisconsin, through the installation of five unit heaters in a specially designed baking oven.

These large vertical discharge propeller fan unit heaters maintain a 180 deg. F. temperature in the Case Company's 23,000 cu. ft. oven, which is able to dry more than 53,000 pounds of paint-sprayed farm machinery parts per hour. Passage of the painted parts through the drying oven requires a time cycle of approximately 35 minutes.

Work that is handled is suspended from an overhead chain conveyor which carries the painted material from the paint spray room some 75 feet away from the oven. The conveyor moves the painted parts alongside the unit heaters which are hung from the oven ceiling (see Fig. 1). When

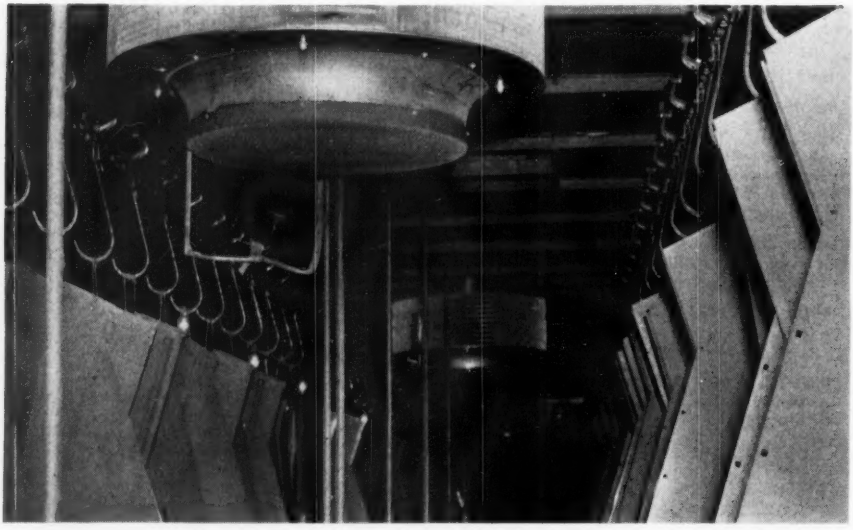

Fig. 1—The interior of the J. I. Case Company paint baking oven shows the spacing of the unit heaters with the parts passing through the heated air flow. Because of the effectiveness of the heaters, the time cycle is reduced to 35 minutes.
(*Photo courtesy Young*)

painted, dried parts reach room temperature after passing through the oven, the surface film is completely stable. Then decal nameplates can be applied immediately.

Unit Heaters Dry and Ventilate

The use of unit heaters was decided on in view of the fact that the oven problem was really two-fold in nature. First, it was necessary to meet the total heating load of 1,890,600 Btu per hour. Second, industrial insurance standards required that 10,000 c.f.m. of standard air be exhausted per gallon of volatiles in the oven. The latter was, of course, in the interests of reducing the hazards of explosion and fire.

The five units installed are capable of delivering 2,750,000 Btu per hour, allowing for future increases over the present requirement of under 2,000,000 Btu. The units warm up the oven to 180 deg. F. from a cold start in less than five minutes. Actually, the oven

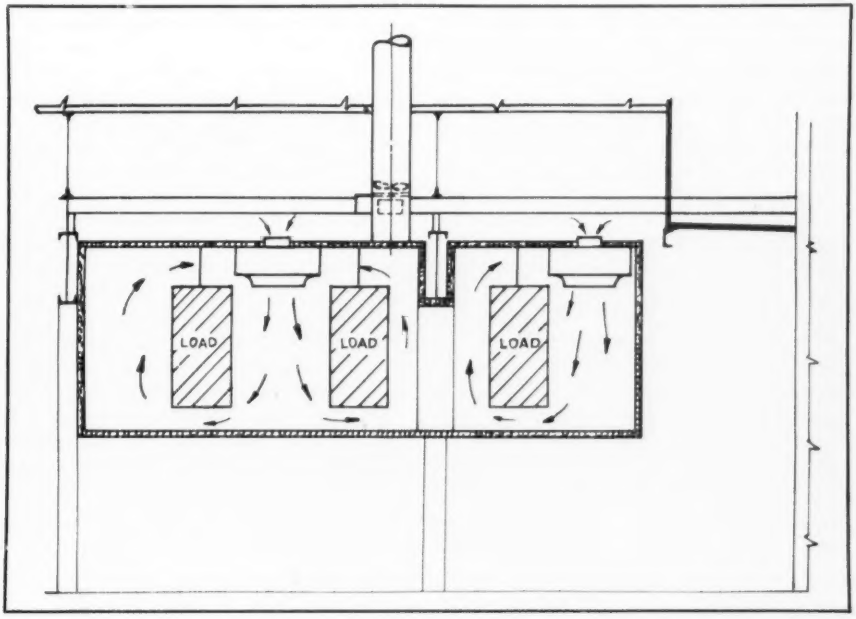

Fig. 2—This sketch of a cross-sectional view of the oven shows how the circulation of heat completely surrounds the drying parts so that all surfaces are exposed to the same amount of heat. *(Illustration courtesy Young)*

can be operated with only three of the unit heaters.

Each unit delivers 11,380 c.f.m. of standard air making the total air delivery 56,900 c.f.m. Air circulation within the oven is thus provided at the rate of twice the oven volume per minute and results in rapid and efficient drying.

Six hundred fifteen c.f.m. of the 11,380 c.f.m. per heater is room air introduced through the stack-like motor mounting for normal motor cooling. Fastened to each stack intake is a short duct section which provides a portion of the oven ventilation requirements (see Fig. 2). The unit heaters themselves are hung in the oven on hooks. Therefore, an entire unit can be dismounted in a matter of a few minutes.

Fumes and Heat Are Efficiently Confined

The unit heaters provide the oven with an air change about every four minutes. Because the exhaust fan, a 24-inch tubeaxial, has a capacity of 6,000 c.f.m. at 180 deg. F., and the unit heaters furnish a total of 3,075 c.f.m. of room air, 2,280 c.f.m. at 180 deg. F. are needed to balance the exhaust. The entering and exit openings supply this remainder to make up the balance. A favorable result is that the oven is kept under a slight negative pressure. Therefore, fumes and hot air tend to be confined in the oven and kept from spreading into the work area of the plant.

Each unit heater is separately controlled by pneumatic devices, except for starting and stopping which are done manually. Two thermostatic bulbs in the discharge air stream and at the side of each heater regulate the units by modulating the steam supply valve.

The exhaust fan is interlocked with the unit heaters and, hence, is automatically started when the conveyor is set into motion. It operates until the heater motors are shut off.

Lower Operating Costs

The method of installing the unit heaters insures not only dependable performance but lower operating costs by prolonging the life of the heaters and their component parts. In each heater, a stack extension projects through the oven ceiling. Because of the unique built-in ventilating stack for cooling the motor, 70 deg. F. room air is drawn over the motor continuously when the fan is in operation. When stopping operations, thermostatic controls keep the heater fans operating until the oven temperature drops below 110 deg. F., protecting the motor insulation. Fire hazard is definitely reduced as well.

Case Company officials designed the oven installation so as to effect a sizeable saving in construction costs, as compared with conventional fan and duct drying systems, and also to reduce power requirements and drying time. Experience to date indicates that these goals have been achieved.

Oven Is Unique

As for the oven itself, the main body is 108 feet long, 27½ feet wide, and 8¾ feet from floor to ceiling. It is

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mounted from columns 8¾ feet above the normal floor level. In this way floor space below is conserved, and is now used for manufacturing and stock purposes.

Number 20 gauge steel sheets were screwed together on a welded, channel iron frame to make the oven walls, floor, and roof. Three inches of foam glass insulation on the floor and two inches of the same material on the walls and roof provide an adequate barrier to prevent heat loss.

An interesting feature of the oven's design concerns the matter of safety. Several loose panels are so mounted in the ceiling that they will blow outward in case of an explosion. These panels make up about 60 per cent of the total ceiling space. Sprinkler heads inside the oven are set to go into operation at a critical temperature of 286 deg. F.

Metallizing Restores Cylinder Liners

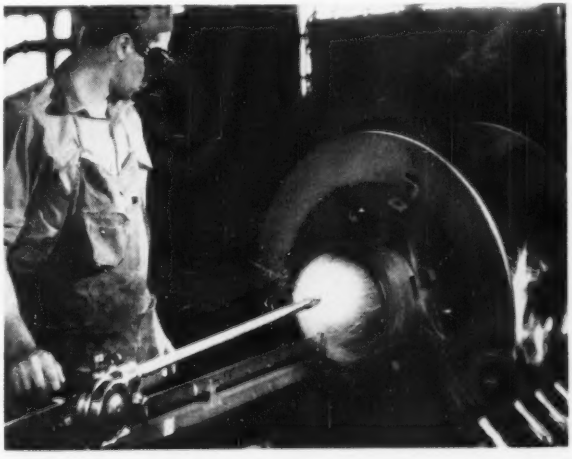
A large Mid-West chemical plant employs fourteen gas engines to drive compressors for 24 hours a day. The machines have 8 cylinders for driving the engines which are hooked into the same crankshaft. After nine years of continuous use, with only routine shutdowns every two years, the engines began to show signs of wear in the top third of the combustion cylinders, due to heat and the abrasive in the fuel.

Of the three methods of reconditioning these engines which were available, metallizing was chose because of its lower cost ($150 per cylinder), and the advantage of maintaining standard dimension.

Cylinders are bored, threaded, grit-blasted and degreased. They are then sprayed with a high chrome stainless steel using spray guns and metal marketed by Metallizing Engineering Co., Inc., 38-14 30th Street, Long Island City 1, New York. Final operations on the cylinders consist of finish-machining and honing.

It was pointed out that the 0.010-inch closer fit than the desired finish size, which is usually allowed for break-in, was unnecessary with the metallized stainless steel since 0.010-inch of wear did not take place during break-in.

During the first year, 64 cylinders were resurfaced at a total saving about $16,000 over other methods and $19,-



Cylinder liners are kept hot while metallized with a high chrome stainless steel.

200 was saved over the cost of new cylinders. Past experience with the greater particle hardness of sprayed metal, its better lubrication characteristics, and a superiority of the stainless steel surface over the original cast cylinders, lead this user to estimate that the rebuilt cylinders are good for another 15 years of operation or over 60 per cent more than the original life.

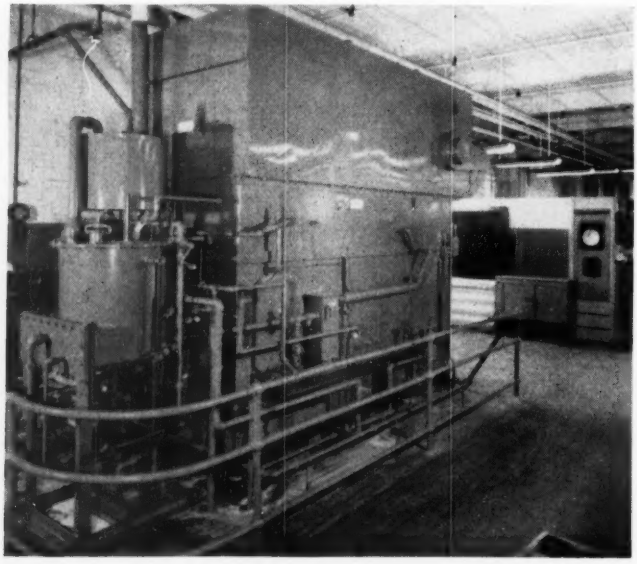
Automatic Temperature Control of Degreasing Operation Cuts Production Costs

A solvent degreaser manufactured by G. S. Blakeslee & Co., 1844 So. 52nd St., Chicago 50, Ill., and equipped with automatic control instrumentation, has speeded instrument production at The Foxboro Co., Foxboro, Mass., where thousands of parts for industrial indicators, recorders and controllers are processed daily. Departmental operating costs have been lowered by minimizing the loss of vaporized solvent.

A Foxboro Dual Temperature Controller maintains completely automatic control of solvent in the unit, and controls both the temperature of the water in the cooling coils surrounding the tank, and the amount of heat supplied to the boiling liquid solvent.

When the vapor level falls, the controller responds to a reduced vapor atmosphere temperature, opening a steam valve to add heat to the solvent and increase the vaporization. However, when the level of the hot (188 deg. F.) vapor rises (as with a small work load) the controller throttles the steam valve to decrease vaporization and return the vapor zone to its proper level.

The temperature of the water in the condensation jacket is automatically and continuously controlled at a fixed



A view of the batch-type, conveyorized Blakeslee degreaser. Work is handled in trays, dipped in solvent and vapor treated. It emerges completely cleaned, dry and oil free in less than one minute, ready for additional machining, finishing or assembly.

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temperature, sufficient to condense all vaporized solvent when no work is in the machine. Protection against solvent waste is assured.

Freight Car Finishes Applied by Hot Spray System

USE of the hot spray system in the application of freight car finishes was recently introduced by The Sherwin-Williams Company in cooperation with The Pullman-Standard Car Manufacturing Co., Michigan City, Indiana. Designed to utilize heat instead of thinners as a viscosity reducing medium, the hot spray system was employed to finish 250 steel freight cars for the Rock Island Lines.

C. B. Bull, general manager of the Transportation Sales Division of Sherwin-Williams, reported that the firm's Hot-Spray Synthetic Freight Car Enamel achieves in one application the equivalent of two coats of conventional freight car paint.

A conventional primer is used prior to the hot spray application, although the primer also may be hot-sprayed to ensure uniform primer viscosity and coverage and to reduce overspray.

Ten steel freight cars were hot-sprayed experimentally in 1948 for the Rock Island Lines, and these have proved the durability, color and gloss retention, and economy of hot spray.

The surface of the steel freight cars was prepared by shot blasting, after which a paint system consisting of one coat of Synthetic Zinc Chromate Primer No. 94, E41R1, and one coat of Hot-Spray Synthetic Frt. Car Red, F44NC41, were applied. The primer was reduced 12.5 per cent with mineral spirits (cold spray), and the enamel was reduced with a maximum of ½ pint of mineral spirits per gallon of enamel (hot spray).

Equipment employed consisted of Bede UU55 circulating paint heaters, Binks No. 18 spray guns with No. 63Pb Air Cap, No. 65 Fluid Tip, and No. 15 Needle, and 45 feet of ⅜-inch hose from heater to spray gun.

Various temperatures of the paint throughout the system were 65-75 deg. F. in the tank; 180-190 deg. F. at the heater; and 145-165 deg. F. at the gun. Shop temperature varied from 65-75 deg. F. Fluid pressure was 35-45 p.s.i. and atomizing pressure 55-65 p.s.i. Operational temperature was reached in 30 to 45 minutes.

In general, approximately 5-5½ gallons of paint are necessary for all four sides of a conventional 40-foot box car including doors. This equals 260-290 square feet per gallon. Approximately 25 to 30 minutes were required to spray one car by one operator.

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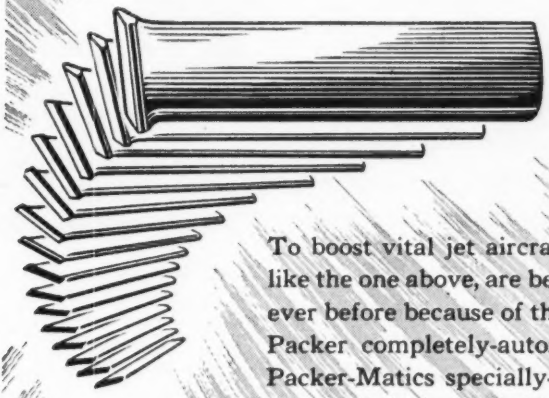
Jet blade production increased



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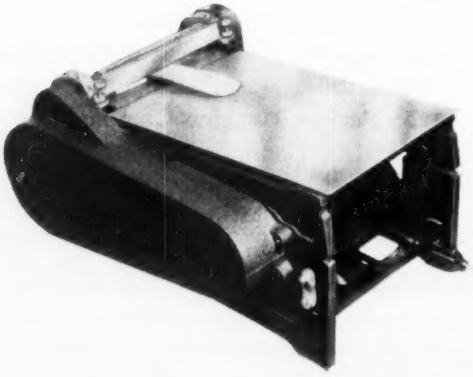
Finishes

The GS Model 22 handlamp features a non-corrosive aluminum bracket and a chromium plated lamp head and reflector.

(Photo courtesy General Scientific Equipment Co., Philadelphia 32, Pa.)

Potdevin Model 2R6 machine is finished in crackle green enamel. Knobs, screws and other small parts receive an attractive and utilitarian black oxide finish.

(Photo courtesy Potdevin Machine Co., Brooklyn 18, N. Y.)



that aid in appearance and utility

Automatic coffeemaker here illustrated is manufactured from copper and is finished in bright chromium plate.

(Photo courtesy Camfield Manufacturing Co., Grand Haven, Mich.)

Body of the 1953 Lincoln Capri hardtop receives four finish coats. First, a red oxide primer surfacer is applied. After baking, this is followed by a gray primer surfacer which is baked, water sanded and dried. Two coats of synthetic enamel are then baked on. In addition to the chromium plated exterior treatment, gold plated V ornaments are used on the sides and on the front of the grill.

(Photo courtesy Lincoln-Mercury Division of Ford Motor Co., Detroit 32, Mich.)

NEWS of the Industry

NEW PLANTS

Opening of a new barrel finishing company to serve the East Coast area—**METAL FINISH, INCORPORATED,** 410 Freylinghuysen Avenue, Newark 5, New Jersey—has been announced by Mr. Paul E. Kirchartz, president of the firm.

A distributor for "Honite" barrel finishing equipment, "Honite" and "Super Honite" chips and "Honite" compounds, the new firm specializes in tumbling equipment, supplies, and service.

Among services provided are engineering and sample processing to determine proper application of the barrel finishing process in a customer's plant; sales engineering of complete barrel finishing installations; and job shop or custom barrel finishing work.

The new plant, with an area of 9,000 square feet, consists of a barrel finishing shop for job work, office and laboratory facilities and warehouse space. The shop will also be used for training customer personnel and for demonstrations of equipment and barrel finishing methods.

Previously Mr. Kirchartz was Eastern Manager of the Almco Division of the Queen Stove Works, Albert Lea, Minnesota, and has over 12 years experience in the development and use of barrel finishing in a wide number of industries.

Construction is under way on an addition to the Chicago plant of the **V. J. DOLAN & CO.** The new structure will be utilized to house additional up-to-date equipment for the manufacture of lacquer and synthetic enamels for wood and metal.

The formation of **HUNTER ASSOCIATES LABORATORY,** 5421 Brier Ridge Road, Falls Church, Virginia, has been announced by Richard S. Hunter, former chief engineer with the Henry A. Gardner Laboratory of Bethesda, Md.

Mr. Hunter, designer of the reflectometer, and his associates, Marshall Powell, electronic engineer and James D. Ferguson, Jr., mechanical engineer, will be prepared, by January 1, to offer to organizations concerned with product appearance, advise on appearance instrumentation, preparation of specifications, tests on materials for regular and special appearance properties, designs of improved appearance testing instruments, and development of procedures for testing, inspecting, and in some cases automatically controlling the appearance quality of manufactured products.

Richard S. Hunter

The cornerstone for a new research center at Frankfurt/Main, in Germany,

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FUME CONTROL SYSTEM
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3. CUTS REPLACEMENT COSTS
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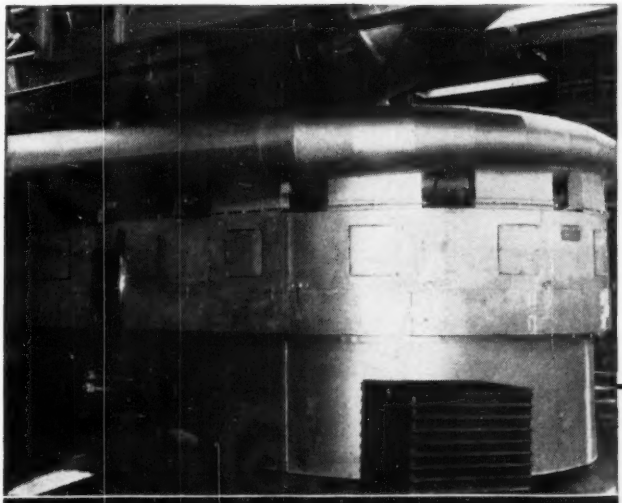
In large and small plants, Fume Control Systems engineered, fabricated and installed by KIRK & BLUM show substantial savings by increasing the life of costly plating equipment.

Here, a hood—with convenient access openings encircles the tanks — preventing cross currents and reducing air volume requirements.

Fumes are picked up at the outside of the tank, clean air is drawn over the machine's mechanism in the center, thereby keeping damaging corrosive fumes away from costly moving or mechanical parts.



KIRK & BLUM Fume Control on an Automatic Plating Machine in a noted auto ignition parts plant. Note hinged anode access and inspection doors just above tank top.

Write for Booklet F, showing typical installations.

The Kirk & Blum Mfg. Co.,
3116 Forrer Street,
Cincinnati 9, Ohio

to serve the industry of that country, has been laid. The new Battelle Memorial Institute for Germany is being established by **BATTELLE MEMORIAL INSTITUTE,** American research foundation at Columbus, Ohio.

Further, Battelle is establishing another research center at Geneva, Switzerland, and has set up a program of fellowships for selected students in the universities of both Switzerland and Germany. In addition, research centers and fellowship programs for other countries of Western Europe are contemplated for the future.

The Frankfurt research center will engage in chemical, metallurgical, and engineering research. The site has been presented by the City of Frankfurt. The laboratory will cost an estimated one million dollars, and another half-million will be required to equip it. Battelle-Frankfurt has been licensed by the Bonn government to operate as an "eingetragener Verein," that is, as a nonprofit organization.

"The accumulated experience in the planning and conduct of research gained through Battelle's twenty-three years of service in America can do much to help industry in Europe increase its productivity and expand its markets," Dr. Clyde Williams, Battelle director, has stated. "At the same time, the establishment of research projects in Europe will create increased opportunities for European scientists and engineers to work more effectively in their chosen fields. They will thus contribute more fully to the welfare of their respective countries."

Battelle in Europe established offices in Geneva, Switzerland, some months ago, and now has an engineering economics group working on industrial surveys. It is now preparing laboratory facilities on a 16-acre plot there. The Swiss laboratory, which formerly housed medical research, is being remodeled and is scheduled for completion and occupancy early next year. Initially a staff of fifteen will be housed there.

Battelle in Europe now has a staff numbering 35, including citizens of Germany, Belgium, Switzerland, France, Holland, and England. A skeleton force of American staff members is now working in Europe on "an extended loan basis." In keeping with the original purpose for Battelle's European program, staffs of Battelle's European units, according to Dr. Williams, will be made up predominantly of Europeans.

Battelle Memorial Institute was founded and endowed to serve mankind through the application of science to the problems of industry. Since 1929, at its laboratories in Columbus, Ohio, it has served the industry of America and other continents. Currently, it has a staff of 1,930 scientists, technologists, and assistants. This year it will conduct an estimated $12,000,000 worth of research.

Fields of research at Battelle in Columbus include: production engineering, mechanical engineering, industrial physics, metallurgy, chemistry, chemical engineering, ceramic technology, graphic arts technology, welding technology, electrochemistry, air and stream pollution, mineral processing, engineering economics, electrical engineering, fuels and combustion, agricultural sciences, plastics, rubber and paints, electronics, theoretical and applied mechanics, and nucleonics.

The **HANNA PAINT MANUFACTURING CO.** of Columbus, Ohio, has announced construction of a new factory on East Windsor Ave. at the Pennsylvania Railroad crossing. The combined operations of the Hanna Paint Manufacturing Co. and the Hanna Industrial Finishes Divi-

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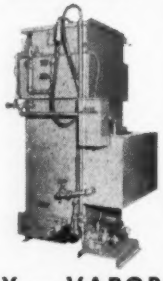

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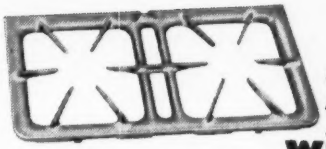

Stove top grids finished twice as fast with 3M Abrasive Belts!

PRODUCTION PROBLEM: To cut unit costs of finishing stove top grids and produce a more uniform finish. (Manufacturer found conventional grinding wheel turned out only 50 units per hour, left unsatisfactory finishes, tired operators.)

3M SOLUTION: A 3M Representative analyzed the grinding and finishing operations at The Mount Vernon Furnace Mfg. Co., and recommended a conversion to 3M Backstand Method using fast-cutting 3M Belts (#36 Three-M-ite resin bond, size 3″ x 132″) and special rubber contact wheel.

THE RESULTS! A production step-up to 100 units per hour for this Illinois manufacturer! Better, more uniform finishes. *Safer* grinding, *less* operator fatigue!

We believe a 3M Sales Representative can suggest ways of reducing your production costs or increasing output. His services are available without cost or obligation.

WANT MORE INFORMATION?

Minnesota Mining & Mfg. Co.
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Return this coupon for additional facts on 3M Abrasive applications. ☐ Have 3M Representative call.

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Makers of "SCOTCH"® Pressure-Sensitive Tapes • • "SCOTCH"® Sound Recording Tape
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sion will be consolidated in the pew plant which is scheduled for completion within a year.

The main building will contain approximately 100,000 square feet of floor space and will be one and three storied construction. Air-conditioned offices, laboratories, receiving and shipping departments and storage for finished products will occupy the large first floor area. The three storied section will be devoted to manufacturing operations and will permit the gravity flow required in the making of paints. A separate building will be constructed for varnish making and a third building for lacquer.

Hanna Paint also has factories in Pittsburgh, Birmingham and Dallas, with branches and distribution centers in principal cities throughout the United States.

Lloyd B. Portzer, president of **SMOOTHEX, INC.**, has announced the completion of a new plant at 10705 Briggs Road, Cleveland 11, Ohio. The building contains up-to-date offices, laboratory and plant.

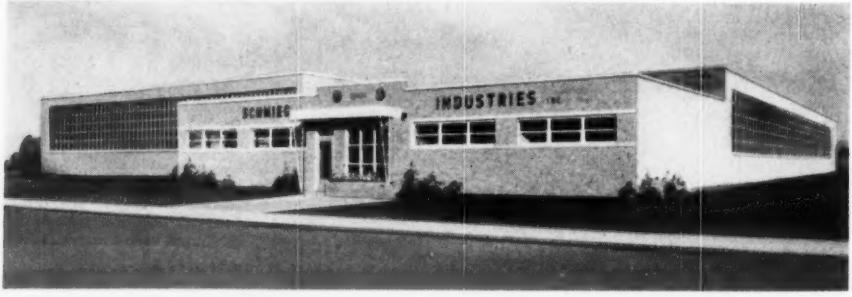
SCHMIEG INDUSTRIES, INC., has moved into a new and larger plant located at 23930 Sherwood, Detroit, Michigan, Frank A. Schmieg, president, has announced. The additional plant capacity is needed to house new and improved machinery and other equipment.

Schmieg engineers and manufactures the patented "Centri-Merge" wet type of dust collector which contribute greatly to the efficiency of dust and fume control installations. Other Schmieg products include spray booths, mechanical washers, production finishing systems, industrial ovens, sheet metal equipment and accessories.

MORSE MANUFACTURING CO., Syracuse, New York, has announced plans to expand production facilities in a new plant at 727 West Manlius Street, East Syracuse. The move is part of an expansion program made necessary by the company's increasing volume of business and additions to the Morse line of drum handling equipment, trucks, dollies and drum faucets.

COMPANIES

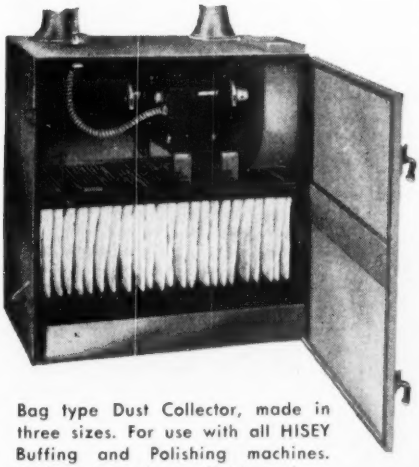
According to an announcement by Mr. J. N. Merkle, president of **THE BALMAR CORPORATION**, Woodberry, Baltimore, Maryland, the name of the company has been changed to Franklin Balmar Corporation. Mr. Merkle outlined that this change was made to better identify the scope of the business being conducted by the Corporation. Franklin Balmar Corporation is the manufacturing subsidiary of the Franklin Railway Supply Company. The officers of Franklin Balmar Corporation are the same as those of The Balmar Corporation, with the addition of Mr. J. E. Long, vice president in charge of product sales, and Mr. J. J. Kirchhof, vice president in charge of engineering.



New plant of Schmieg Industries, Inc.

HISEY Buffer with independent motor for each spindle. For two man operation without interference.

A Good Buffer At An Honest Price



Bag type Dust Collector, made in three sizes. For use with all HISEY Buffing and Polishing machines. Cyclone type also available in three sizes.

Without knowing all details, we cannot say we will increase your production or lower your cost. But, with the experience and know-how accumulated since 1896, we can guarantee you a machine that will give long, trouble-free service at a minimum cost per year of operation.

HISEY Buffing and Polishing Machines are made from small bench sizes up to 30 H.P., in a variety of types to meet all requirements.

All are described in our new catalog.

Your copy is waiting.

Write for Catalog 72 PC today!

Hisey THE HISEY-WOLF MACHINE CO.
CINCINNATI 8, OHIO
Division of The Cincinnati Electrical Tool Co.

WAGNER BROTHERS, INC., Detroit, Mich., manufacturer and distributor of plating supplies and equipment, has retained John D. Tebben & Company, Birmingham, Mich., management consulting firm, with a view toward strengthening the sales organization. A complete survey of the markets for the various products manufactured and distributed by Wagner Brothers is being conducted under the personal direction of John D. Tebben. Expansion and alteration of the present distribution and warehousing facilities and methods are now in process, according to O. H. Tiedeman, vice president in charge of sales.

THE BEACH AIR BRUSH CO., Harrison, New Jersey, has acquired the paint spray equipment business of the **BLACK MFG. CO.**, Parkton, Md.

The name, Black Mfg. Co., will be retained. Its Black Arrow spray equipment will continue to be promoted exclusively through jobbers. Executive offices formerly located at Parkton, Md., have been moved to 201 Second Street, Harrison, New Jersey.

The accompanying illustration depicts the Coracle dinghy, manufactured of Fiberglas by the patented molding method, which is used for manufacturing Laminex Fiberglas tanks used industrially for many metal finishing operations and distributed nationally by **MacDERMID INCORPORATED** of Waterbury, Conn.

The boat or "dinghy" was on display at the MacDermid Incorporated booth in Chicago during the A.E.S. Industrial Finishing Exposition. Fiberglas Laminex tanks were also on display and caused comment due to their light weight and durability.

Laminex Fiberglas dinghy

UNITED CHROMIUM, INC., New York, has announced that the **S. A. WILLIAMS CO.** of Baltimore, Md., has assumed distribution of Ucilon Protective Coatings in the Baltimore, Washington, Norfolk, and Richmond areas.

NEW POSITIONS

GUSTAVE H. WESCOTT, of E. I. du Pont de Nemours & Co., has been elected to the presidency of the Federation of Paint and Varnish Production Clubs for 1952. He succeeds Hiram P. Ball, whose tenure of office terminated at the close of the Annual Meeting in Chicago.

Gustave H. Wescott

The Federation's new leader was president of the Philadelphia Club, and has been a member of the Federation Executive Committee for the past two years. Some of his Federation activities include the compilation of the internationally accepted Exposure Standards Manual and chairmanship of various committees.

Mr. Wescott earned his B.S. degree at the University of Richmond and since that time has been employed by the Du Pont Co. in practically all phases of laboratory work in the decorative and protective coatings industries. He is a member of Phi Delta Omega, Omicron Delta Kappa, and the American Chemical Society.

treat

TOXIC CHROMIUM WASTES

by **REDUCTION**

Chromium wastes, because of their toxicity and high color, are a problem for industry and an annoying source of stream polution.

Reduction of toxic hexavalent chromium wastes to the trivalent form with sulphur dioxide, and subsequent precipitation with alkali, has become widely accepted in the plating industry. Wallace & Tiernan offers not only the equipment for feeding sulphur dioxide but also the experience of many installations to successfully carry out the reduction process.

CYANIDE WASTES

Wallace & Tiernan's service to the metal finishing industry also includes experience and equipment for effective destruction of cyanide wastes by alkaline chlorination. Automatic control equipment assures complete cyanide destruction with minimum chemical costs.

Write today for additional information on Wallace & Tiernan equipment for the reduction of toxic chromium wastes with sulphur dioxide and the oxidation of cyanide wastes by alkaline chlorination.

W & T Sulphur Dioxide Feeder

WALLACE & TIERNAN
COMPANY, INC.
CHLORINE AND CHEMICAL CONTROL EQUIPMENT
NEWARK 1, NEW JERSEY • REPRESENTED IN PRINCIPAL CITIES

S-78

The appointment of **PAUL H. GOODELL** as sales manager of the Catalytic Combustion Corporation, Detroit, Mich., has been announced by R. J. Ruff, President.

Mr. Goodell, formerly associated with Jensen Specialties, Inc., and the Trumbull Electric Department of the General Electric Co., is now chairman of the Electric Heating Committee of the American Institute of Electrical Engineers. In his new capacity, Mr. Goodell will be assisting industrial plants in the application of the Catalytic Combustion Process.

Industrial Lubricants Co., Detroit, Mich., has announced the appointment of **W. C. KENNEDY** as general sales manager and **HUBERT E. EXANS** as chief chemist.

Mr. Kennedy comes to Industrial Lubricants with 20 years' executive experience in the automotive, materials handling, aircraft and industrial chemical and lubrication industries.

Mr. Evans, previously a technical director for a manufacturer in a related field. will be in charge of new product development and control. He has over 25 years' experience in research and development, engineering, and sales and customer service.

(Left), Hubert E. Evans, W. C. Kennedy.

CHARLES A. FRAWLEY has joined the sales staff of the Northwest Chemical Company, 9310 Roselawn Ave., Detroit 4, Michigan, to service accounts in northern Ohio. Mr. Frawley, a native of Cleveland, served with the U. S. Marine Corps in the South Pacific. Since leaving the service, Mr. Frawley has earned a degree from Western Reserve University, worked in various capacities with the Ohio Department of Liquor Control, the Pennsylvania Railway, the Klaas Machine and Manufacturing Company and the Waverly Petroleum Products Company. Mr. Frawley's academic and industrial background equips him to serve well the technical problems encountered in the metal products finishing industry.

Seymour Troy, vice-president and general factory manager of Eastern Metal Products Co., Tuckahoe, N. Y., has recently announced the appointment of **ROBERT J. GORDON** as works manager. Mr. Gordon returned to this company where he held the position of supervisnig engineer until 1951. Since then he had been with the Detrex Corporation. Mr. Gordon is a native of Eastchester and attended the Engineering Extension at the University of Connecticut.

The appointment of **JOSEPH S. IMIRIE** to the newly created position of assistant to the president, has been announced by Clinton F. Robinson, Pres-

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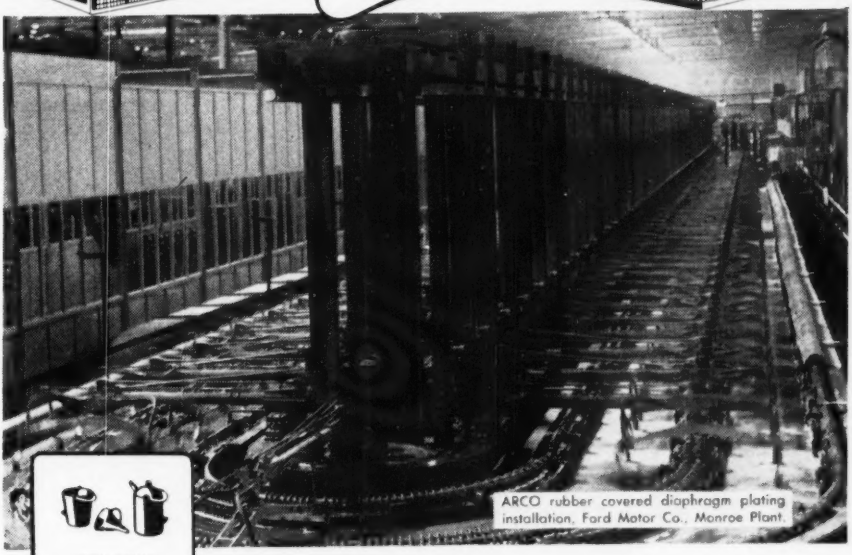
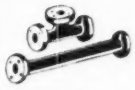


ARCO rubber covered diaphragm plating installation, Ford Motor Co., Monroe Plant.

RUBBER COVERED UTENSILS



RUBBER LINED PIPE AND FITTINGS

RUBBER COVERED TANK GRIDS

Rubber Protected Equipment For Electroplaters

Let ARCO engineers assist you in converting to the "Diaphragm" method of plating.

• For complete details ask your jobber or write for this Diaphragm booklet.

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ident of The Carborundum Company, Niagara Falls, New York.

In his new position, Mr. Imirie will render staff assistance to the president and executive vice president in the general management of the business of the company. He has been with The Carborundum Company since January 1952, serving in the investigation of new products.

Wagner Brothers, Inc., Detroit manufacturers and distributors of plating and polishing supplies and equipment, have announced the appointment of **A. A. SCHUENEMANN** as sales representative for northern Ohio. According to O. H. Tiedeman, vice president in charge of sales, Mr. Schuenemann will be located at 6502 York Road, Parma Heights, Cleveland, to handle Wagner business in Elyria, Toledo, Cleveland, Akron, Canton, Youngstown, Mansfield as well as the greater Cleveland area.

A. A. Schuenemann

Mr. Schuenemann has been associated with Udylite Corporation as a sales engineer for the past seven years and is well known to the plating industry. For ten years prior to that he was with Harshaw Chemical Co. Technical Sales Division. He received a degree in Electrical Engineering from Ohio State University in 1930.

The Michigan Chrome & Chemical Co., Chemical Division, Detroit 7, Mich., has announced the retirement of **GEORGE H. RUSS**, sales manager, due to ill health.

In the seven years during which Mr. Russ piloted sales of the Chemical Division, Michigan Chrome expanded its complete line of rack coatings, stop-off materials and corrosion resistant coatings for the electroplating industry to a strong position in the field.

KING RUHLY formerly assistant sales manager, has been appointed sales manager to replace Mr. Russ. Mr. Ruhly represented Michigan Chrome in the Chicago area for five years prior to assuming his new duties in the home office last March.

King Ruhly

He will now direct sales and advertising of the wire coatings, fabric coatings, and electroplating materials manufactured under the trade names "MICCRASOL" and "MICCRO Products."

FRANK JONES has been promoted to assistant sales manager, Mr. Jones represented Michigan Chrome in the New England area for five years prior to his appointment. He was instrumental in the successful development and distribution of vinyl plastisols for wire basket coatings.

Mr. Jones will concentrate his efforts as assistant sales manager on the establishment of new channels of sales and new products in the vinyl plastisol field.

Yes: WE'D LIKE TO GET A COPY OF THE BIG NEW M & E SPRAY FINISHING EQUIPMENT GUIDEBOOK

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PAINT SPRAY FINISHING SYSTEMS
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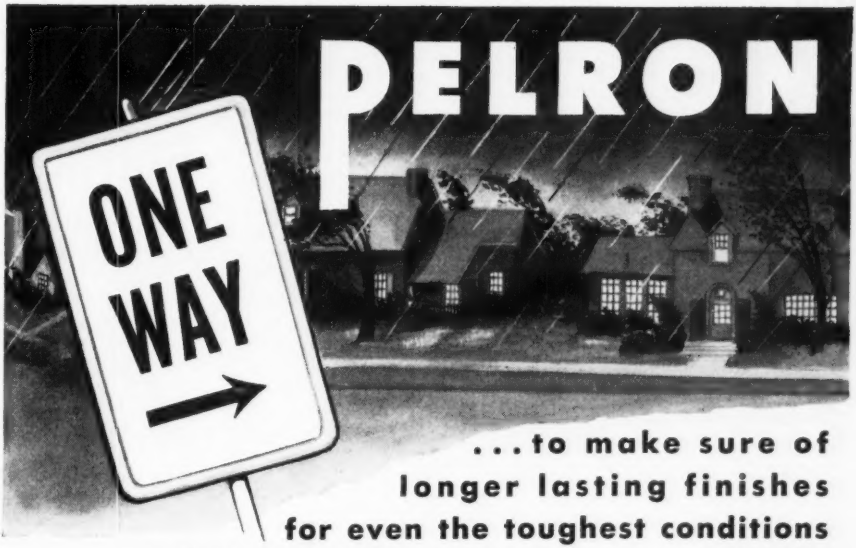

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for even the toughest conditions

use PELRON Phoscote 299

The road sign above will say ONE WAY longer, no matter what the weather, if it's been properly cleaned and phosphatized before painting. "One way" to make sure is to use PELRON Phoscote combination cleaning and phosphatizing agent. It provides a better phosphate base for long lasting finishes at lower cost to you. Also many other phosphating chemicals available to meet *special* requirements. Get a recommendation from your Pelron representative today.

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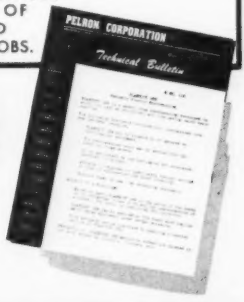
- CLEANS AND PHOSPHATES IN ONE OPERATION
- MORE ECONOMICAL
- SPEEDS UP PRODUCTION
- PRODUCES A COATING WEIGHT UP TO 200 mg. PER SQ. FT.

SEND FOR TECHNICAL BULLETIN ON APPLICATION METHODS FOR ALL TYPES OF CLEANING AND PHOSPHATING JOBS.



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CORPORATION
INDUSTRIAL OILS AND CHEMICALS
FOR BETTER PRODUCTION AT LOWER COST

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Arthur Murphy

Richardson-Allen Corporation, Flushing, New York, manufacturer of rectifiers for electroplating plants, has announced the appointment of **ARTHUR MURPHY** as a field engineer for the New England Area. Mr. Murphy is well known in this region by virtue of his many years' service in the mechanical and electrical industries. His headquarters will be in Boston at 25 Huntington Avenue.

The Hanson-Van Winkle-Munning Company, Matawan, N. J., has announced the appointment of **THOMAS J. MENZEL** to the position of manager, Electroplating Section. In his new position, Mr. Menzel will be responsible for all experimental and sample plating carried out for customers at the Company's modern plating laboratory.

George A. Menz

The Sherwin-Williams Co. Cleveland factory has announced the appointment of **GEORGE A. MENZ** as general superintendent of operations for the paint manufacturing firm.

Mr. Menz, formerly general superintendent, will supervise all Sherwin-Williams factories in the United States under Victor Mills, general manager of paint, varnish and lacquer manufacturing operations.

M. W. HURDELBRINK, succeeds Mr. Menz as general superintendent and held a similar position at the Chicago factory of Martin-Senour Company.

The Hanson-Van Winkle-Munning Co., Matawan, N. J., has announced the appointment of **L. JOSEPH MOYES** to its sales staff. Mr. Moyes' headquarters will be in Milwaukee, Wis., and he will service customers in Wisconsin, Minnesota and upper Michigan. He replaced Mr. E. C. Bosl who has been transferred to the Company's Chicago office to give electrochemical service to customers in the midwest.

L. Joseph Moyes

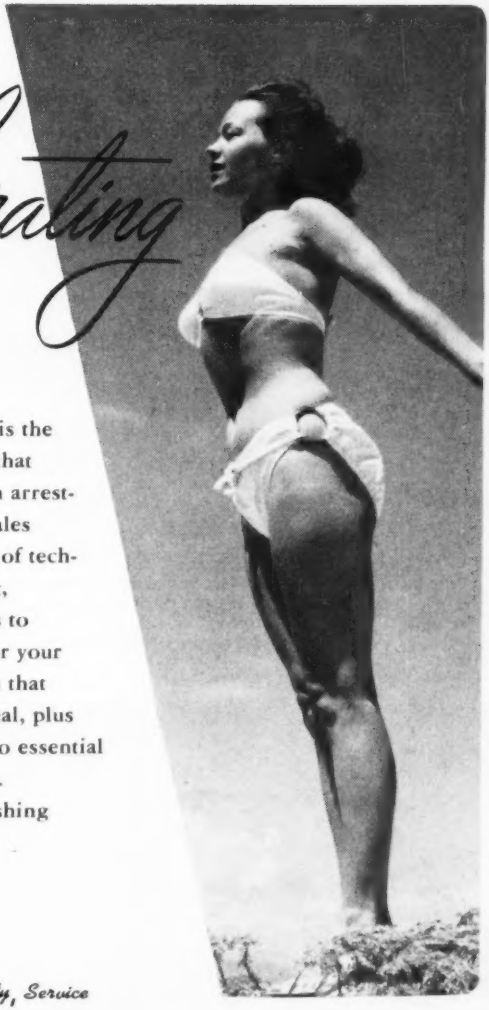
Mr. Moyes has been in the metal finishing industry for fifteen years, and in recent years his particular interest has been in cleaning and preplating cycles. From this work he has gained a wide background in all types of buffing, polishing and plating procedures and is well equipped for his new assignment.

WILLIAM A. HOPKINS has recently been named general sales manager of Bart-Messing Corporation of Belleville, New Jersey.

William A. Hopkins

Since 1934 Mr. Hopkins has been identified with many phases of the electroplating industry. After studying metallurgical engineering at University of Cincinnati, he was employed as a plating engineer with the Electric Auto-Lite Company. During World War II he was associated with Kellex Corporation in work on the Manhattan Project. In recent years he has been associated with Gerity-Michigan Corporation as technical director and The McGean Chemical Company.

Exhilarating



A fine, distinctive finish is the final exhilarating touch that gives a product attention arresting characteristics . . . sales appeal. Our skilled staff of technicians have the training, experience, and facilities to produce a good finish for your product . . . a finish with that all-important Sales Appeal, plus the protective qualities so essential to consumer satisfaction. Write us about your finishing problems.

Research, Quality, Service

Affiliate
GORDON BARTELS CO.
Roller Coating Specialists

ROCKFORD VARNISH
Company
ROCKFORD, ILLINOIS
Manufacturers of Protective and Decorative Coatings

JOSEPH M. TOBIN has been elected, by the faculty at Michigan State College, to receive the graduate fellowship sponsored by Hanson-Van Winkle-Munning as part of its policy of promoting study of fundamental research in electroplating and allied fields. Mr. Tobin will study the "Diffusion Rates of Gases Through Metal Films."

Administration of the fellowship is under the direction of Dr. D. T. Ewing of Michigan State College. Russel H. Fay, recipient of the fellowship for the past three years, is now a teaching assistant in the Physical Chemistry Department.

MEETINGS

THE BALTIMORE - WASHINGTON BRANCH, A.E.S., has announced its **ANNUAL EDUCATIONAL SESSION** followed by an evening dinner and dance on Saturday, January 17, 1953 at the Statler Hotel, Washington, D. C.

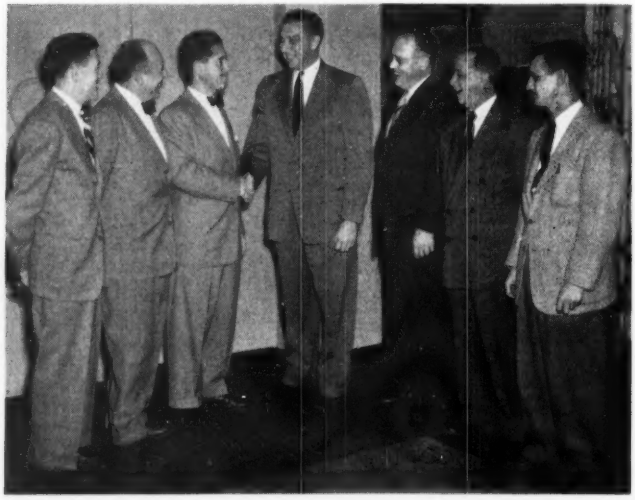
The **CHICAGO BRANCH, A.E.S.,** has announced that its **41ST ANNUAL EDUCATIONAL SESSION AND BANQUET** will be held Saturday, January 31, 1953, in the North Ballroom of the Conrad Hilton Hotel.

The Educational Program will begin at 2:00 P.M. with a talk by Myron Diggin, technical director of Hanson-Van Winkle-Munning Co. Mr. Diggin will speak on "Recent Developments in Precious Metal Plating." Following this talk, R. W. Redmond, process engineer, Oldsmobile Corporation, will speak on "Prefinishing of Steel." Dr. Charles G. Moore, technical director, Glidden Co., (Nubian Div.) will close the program with a talk entitled "The Development of Modern Organic Finishes."

The Banquet will be held at 7:00 P.M. in the Grand Ballroom. Tickets, at $10.00 each, may be obtained from Paul Glab, 882 N. Paulina St., Chicago 22, and other Chicago Branch officers.

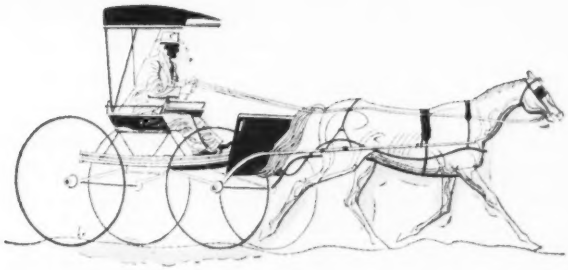
SOCIETIES

At a recent meeting of the **BRIDGEPORT BRANCH, AMERICAN ELECTROPLATERS' SOCIETY,** B. F. Ames, general sales manager of the Maas & Waldstein Co., Newark, Chicago and Los Angeles, manufacturer of industrial finishes, spoke on the subject, "What's New in Organic Finishes." He outlined advantages and disadvantages of synthetic coatings made from epon resin, phenolic resin, alkyd resin, stryenated resin, urea resin and urea modified melamine. He also pointed out the advantages and disadvantages of vinyl coatings as well as



Group at Bridgeport Branch, A.E.S. Meeting. Left to right: John Mallick, General Electric Co., Bridgeport, Conn.; Robert G. Parker, Casco Products Corp., Bridgeport, Conn.; B. F. Ames, Maas & Waldstein Co., Newark, N. J.; Raymond W. Goral, Enthone Inc., New Haven, Conn.; Floyd M. Erlenmeyer, Maas & Waldstein Co., Newark, N. J.; George C. Wagstaff, Lock City Electro Plating Co., Stamford, Conn.; Virgil S. Consalvo, General Electric Co., Bridgeport, Conn.

Perhaps YOU WERE NOT YET BORN

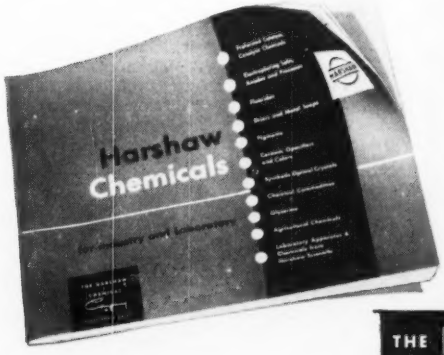


when Harshaw first produced plating materials

Then again, perhaps you plated with Harshaw nickel as far back as the year 1898 . . . when we started producing for the plating industry.

If you are an old-timer, then you know first-hand the dependability of Harshaw plating materials. And you know how often Harshaw has been **FIRST** with important new developments . . . For instance, back in the 20's when our discoveries brought "rolled depolarized and rolled carbon" nickel anodes, and in 1934 when Harshaw developed "Nibrite," the first *bright* nickel. Harshaw installed the first commercial bright electroplating bath in 1935.

That was a famous first, as you will recall. Of equal importance, too, were our introductions of fine crystal single nickel salts, and Perflow, the first truly leveling nickel deposit.



If you're a youngster, well then you should know more about us, and for that reason we have prepared a 16-page booklet which tells all about us — how thoroughly we serve the plating industry, and other major industries such as ceramic, petroleum, metalworking, paint, and others as well. Write for this free booklet. We'll be happy to send it.

THE **HARSHAW CHEMICAL** CO.
1945 East 97th Street, Cleveland 6, Ohio
BRANCHES IN PRINCIPAL CITIES

ethyl and nitro cellulose products. He presented detailed technical data concerning Plextone, Maas & Waldstein's new multi-colored enamel, pointing out that black and white Plextone enamels may be mixed yet black and white color particles may be distinguished. The expected gray color does not result.

At the **ANNUAL EDUCATIONAL SESSION AND BANQUET** of the **PHILADELPHIA BRANCH, AMERICAN ELECTROPLATERS' SOCIETY,** held on November 22 at the Broadwood Hotel, Philadelphia, the speakers discussed nickel plating, zinc and cadmium plating, and cleaning.

Dr. R. B. Saltonstall, technical director, Udylite Corporation, spoke on "Nickel Plating—Today and Tomorrow." Dr. Saltonstall pointed out that one reason for the current shortage of nickel is that large quantities of the metal are required for jet engines. Of the nickel used in plating, approximately 25 per cent is used either directly or indirectly for military applications.

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DETROIT "TAC" RAG
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DETRO MFG. & SALES CO., CULVER CITY, CALIFORNIA

The speaker stated that in his opinion the future of nickel plating would involve further developing in leveling and line removing ability, better control of physical properties, better corrosion resistance from thinner coatings of nickel, further expansion in the applications of nickel plating such as strip and wire plating, electrotyping and general engineering purposes.

Mr. E. F. Ottens, Philco Corporation, first vice president of the Philadelphia Branch, discussed "Practical Aspects of Zinc and Cadmium Plating." The following bath composition was recommended:

zinc cyanide	10 oz./gal.
sodium cyanide	7.5 oz./gal.
sodium hydroxide	10 oz./gal.
temperature	90 deg. F.

Using a current density of 40 amp./sq. ft., a thickness of 0.00015 to 0.0002 inch of zinc can be deposited in five minutes Sodium sulfide is maintained in the bath to precipitate lead, which is introduced from the anodes. Zinc dust treatment and dummying are required to remove copper. Cleaning is done in two stages: spray cleaner with a diphase emulsion cleaner; electrocleaner.

To activate dry zinc plated work for further treaments, the following was recommended:

1. vapor degrease.
2. dip in weak HCl until gassing starts.
3. dip in a solution of 0.25 oz./gal. cadmium oxide, 9 oz./gal. sodium cyanide.

To remove smut brought out by pickling the following will help: hot cyanide solution, 1-2 lb./gal.; or, alkaline derusting compounds.

Dr. Wm. L. McCracken, director of research, Detrex Corp., addressed the meeting on "Periodic Reverse and Ultra-Sonic Cleaning." Periodic reverse cleaning employs a specially designed, neutral electrolyte at 8 oz./gal. and 100 amp./sq. ft. The optimum time cycle is four seconds anodic and one second cathodic. In one to three minutes a few millionths of an inch of metal is removed and with it any adhering soil or smut. The removed metal is precipitated as an insoluble phosphate. Dr. McCracken demonstrated periodic reverse cleaning at the conclusion of his talk.

Also demonstrated was ultra-sonic cleaning, employing a high frequency sound source of high intensity in a liquid medium. This literally shakes the liquid against the work as well as vibrates the work itself. The demonstration included two barium titanate ceramic crystals, each vibrating at a frequency of 400 kilo-

METALWASH

A score of custom-built METALWASH machines treat a myriad of ball bearings of different types and sizes every day at the Fafnir Bearing Company Plant in New Britain, Conn.

AT FAFNIR

Because the manufacture of precision ball bearings to exacting specifications demands repeated washings, the Fafnir Bearing Company insists on METALWASH.

The rigid control exercised in ball bearing production is dramatized by METALWASH MACHINERY CORPORATION in the January issue of the *Finishing Engineer*.

Read THE FAFNIR STORY for an exciting close-up of precision ball bearing manufacture.

METALWASH *Finishing Engineer*, published quarterly, is available on request to engineers and executives to whom cleaning and finishing are operations of interest.

Write on your company letterhead for your free copy.

METALWASH

MACHINERY CORPORATION

915 North Avenue, Elizabeth 4, N. J.

Representatives in principal cities

Fig. 1 — (left) Philadelphia Branch President Alfred H. Pope, Pennsylvania Salt Manufacturing Co., welcomed the members and guests to the Educational Session. Also shown in the photo are (left to right) Dr. Wm. L. McCracken; I. Wm. Markovitch, Philadelphia Branch Secretary; Dr. R. B. Saltonstall; E. F. Ottens; and C. E. Boerckel, Educational Session Chairman.

Fig. 2—(above, left) Dr. McCracken discusses his demonstration of periodic reverse cleaning.

Fig. 3—(above right) A view of the demonstration of ultra-sonic cleaning.

Fig. 4 — (left) Partial view of the well-attended banquet following the educational session.

Hammond

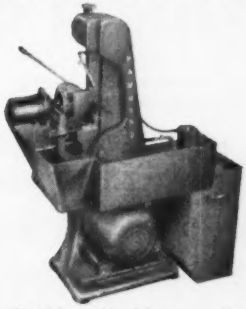
of KALAMAZOO

A COMPLETE LINE OF

GRINDING, POLISHING AND AUTOMATIC FINISHING MACHINERY

MODEL VRO LATHE

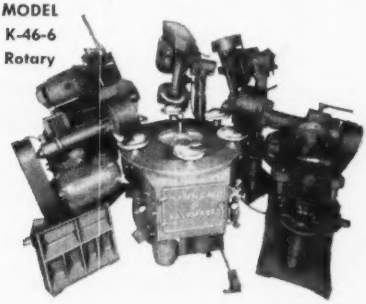
Variable Speed Polishing Lathes — Single and two spindle Lathes — 1500 to 3000 RPM. Also made in single speed models. Also furnished with Backstands for abrasive belt polishing.



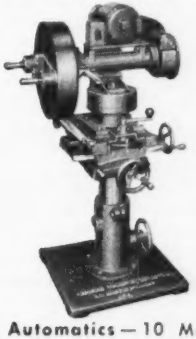
MODEL OD-1

Cylindrical Finishing Machines — For tubes, bars and cylindrical shapes: Model OD-1 up to 2¾" diameter polishing or buffing. Model OD-9 with polishing wheel or belt, for ¼" to 9" diameter.

MODEL K-46-6 Rotary



Rotary and Strait-Line Automatic Finishing Machines — For fast production polishing, buffing, deburring and brushing — Model K-46-6 Rotary shown. Write for catalog on Rotary and Strait-Line Automatics.



MODEL E2PF

Junior Automatics — 10 Models to choose from, according to work requirements. With one, two or four spindles — simple rotating spindle or stroke movement—for use in conjunction with polishing Lathes.

Hammond Machinery Builders INC.

1622 DOUGLAS AVENUE • KALAMAZOO, MICHIGAN

cycles per second and operating in a trichlorethylene bath as a cleaning medium. The first crystal brings the sound energy to a point focus and is adapted to cleaning about one square inch area. The second crystal brings the sound energy to a line focus so that larger areas may be swept in a cleaning operation. Once the minimum threshold energy is determined for a given part, the cleaning time is only a few seconds. Commercial units for plant installations are currently being built. Assisting in the demonstrations were B. Z. Rubin and E. J. Hein.

The meeting attracted visitors from New York, Newark, Detroit, Chicago, and other branches. The executive board of the A.E.S. was well represented by president Franklyn J. MacStoker, first vice president Dr. George P. Swift, and executive secretary Dr. D. Gardner Foulke.

meetings OF INTEREST TO FINISHERS

January 17, 1953. Baltimore-Washington Branch, A.E.S., Educational Session, Evening Dinner and Dance, Statler Hotel, Washington, D. C. Tickets, $6.00 per person, may be obtained from William E. Metzger, Jr., branch treasurer.

Jan. 21. National Spray Painting and Finishing Equipment Association, Chicago, Illinois.

Jan. 24. Grand Rapids Branch A. E. S. Annual Educational Session (2 P. M.), **and Banquet** (7 P. M.), Pantlind Hotel.

Jan. 31, Annual Meeting, Educational Session and Banquet, Chicago Branch, American Electroplaters' Society, Conrad Hilton Hotel, Chicago, Illinois. Tickets, $10.00 per person, may be obtained from Rudy Hazucha, banquet chairman.

Mar. 16-20. Ninth Annual Meeting, National Association of Corrosion Engineers, Chicago, Ill. Protective Coatings Symposium.

Mar. 23-27. American Society for Metals, Western Metal Congress and Exposition. Los Angeles, Calif.

Mar. 28. Cincinnati Branch, A.E.S., Annual Educational Session and Dinner Dance, Hotel Gibson, Cincinnati, Ohio.

Mar. 31-Apr. 2. First International Magnesium Exposition, National Guard Armory, Washington, D. C. Sponsored by the Magnesium Association.

Apr. 18. Annual Technical Session and Banquet, Boston Branch, A. E. S., Hotel Statler, Boston, Massachusetts.

TRAINING COURSES

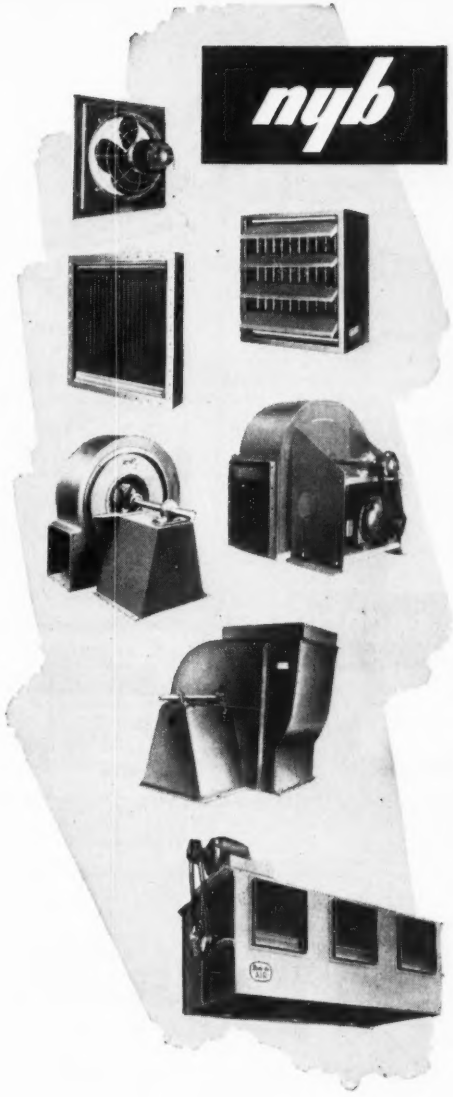
The schedule for the first half of 1953 has been announced by the DeVilbiss Company for courses of instruction in industrial spray finishing methods in its **SCHOOL OF SPRAY PAINTING,** now in its twenty-seventh year of tuition-free operation for users of DeVilbiss equipment. Applications should be made as early as possible for enrolling foremen, shop superintendents, maintenance supervisors, spray operators and any others who wish to attend the week-long classes beginning January 12, February 9, March 16, April 13, May 18, and June 22. These classes will be held in the modern school headquarters now in operation adjoining the main plant at Toledo.

Applications for all classes on the new schedule should be sent out now to the **DeVILBISS COMPANY, TOLEDO 1, OHIO.** Those interested may request School Form INS-753-A. There is no charge for attending, the only expenses being transportation, board and lodging.

NECROLOGY

Announcement has been made of the death of **FRANK J. CLARK,** Plainfield, N. J., pioneer salesman with the Hanson-Van Winkle-Munning Co. A leading figure in the electroplating industry, Mr. Clark was 72.

Mr. Clark had been in the electroplating industry since the early part of the century and with Hanson-Van Winkle-Munning and its predecessor companies for 40 years when he retired in 1948. He was one of the founders of the International Fellowship Club (now Metal Finishing Suppliers Association, Inc.) of the American Electroplaters' Society and a founder and charter member of both the Boston and Springfield Chapters of the A.E.S. He had been granted an honorary life membership in that organization.



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BUILT TO MEET MODERN INDUSTRIAL REQUIREMENTS

For Continuous Heat Service up to 150 Pounds Steam Pressure

Horizontal Type

Ceiling suspension type with heavy duty welded steel fin-and-tube heating element. The rugged arc-welded construction outperforms and outlasts heating elements made of thinner non-ferrous metals. Avoids their expansion-contraction faults, yet has the same BTU efficiency. Ten basic sizes with capacities from 30 Mbh to 490 Mbh. Totally enclosed motors. (Extra heavy non-ferrous coils also available.)

Vertical Projection Type Also Available

For efficient heating from high-ceiling areas—for door heaters over small openings—or where the horizontal type Comet Heater is not applicable. Ten basic sizes; capacities from 27 to 332 Mbh.

Write for Bulletins

No. 513 Horizontal Type
No. 484 Vertical Type

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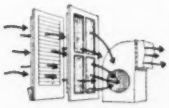
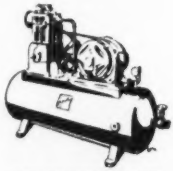
FACTORY, LAPORTE, INDIANA

SPRAY GUNS
36 different models

GUN NOZZLES
1050 combinations



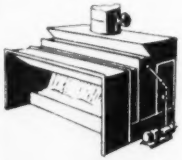
AIR SUPPLY SYSTEMS
filtered, heated air



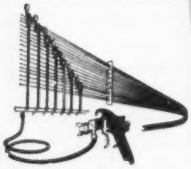
AIR COMPRESSORS
light, medium, heavy-duty

MATERIAL HANDLING
EQUIPMENT
9 models of pumps

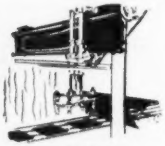
EVERYTHING
1
SOURCE
FOR SPRAY PAINTING



SPRAY BOOTHS
over 510 styles and sizes



PAINT CIRCULATING
SYSTEMS
for identical finishes



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SPRAYING
EQUIPMENT
for lower production costs

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SYSTEMS

OIL AND
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7 models
to supply
clean, dry air

MATERIAL TANKS
2 to 60 gallons

AIR & MATERIAL HOSE
12 types

1069 standard products

to solve your finishing problems!

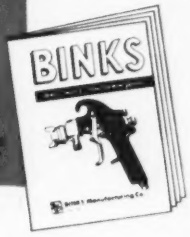
Whether you need help in applying special finishes or coatings to military items or glistening finishes to civilian products...whether you want to spray tar-like sound deadeners or light coats of paint... whether you want to finish automatically at high speed or just do occasional maintenance painting ...in short, *no matter what* your finishing problem, you can get all the spraying equipment you need from *1 source*, Binks.

Moreover, Binks complete line of spray painting equipment saves you time and money because each item is *standard*. If you want special help in selecting or using Binks products, Binks Engineering Department is at your service, without obligation. Send in coupon or write Binks Manufacturing Co., 3118-40 Carroll Ave., Chicago 12, Illinois, for full information.

Save time selecting painting equipment. Mail coupon today!

Binks

EVERYTHING FOR SPRAY PAINTING



Binks Manufacturing Company, 3118-40 Carroll Ave., Chicago 12, Ill.

Gentlemen: Please rush me my FREE copy of your CATALOG-DATA BOOK NO. 955 containing product descriptions indicating how Binks equipment can help me.

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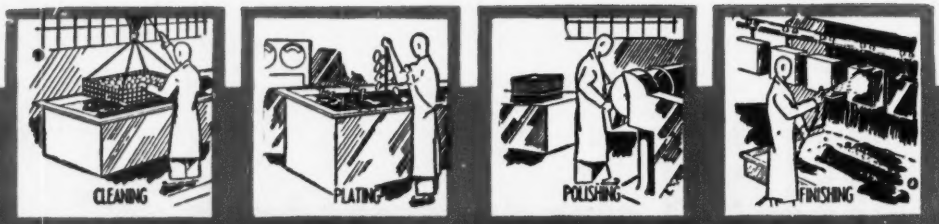


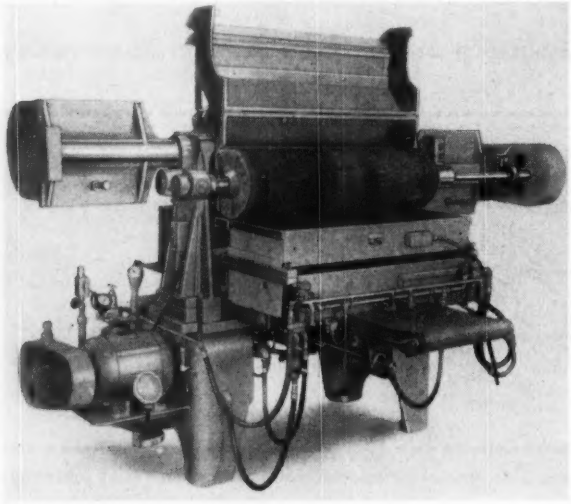
New • EQUIPMENT • MATERIALS • PROCESSES

Surface Finishing Machine

The Model 206-A Surface Finishing Machine, a modification of an earlier model, has been developed specifically for surface finishing hand tools, by the Clair Manufacturing Co., 1010 South Union St., Olean, N. Y.

The manufacturer states that the machine has been re-engineered to increase the horsepower limit to 15, and also has been strengthened structurally to the extent of five hundred pounds of additional weight. The size of the hydraulic reservoir has been increased 50 per cent.

Controlled by an electro-hydraulic system, this machine is of single roll design with 40 inch length spindle and buffs ranging from three to twelve inches in diameter. Optional V-belt drive of the spindle permits variable surface speeds. When used with mechanical holding fixtures, Model 206-A provides a working space 38 inches wide and 24 inches deep. The largest available magnetic chuck is installed on a three-way adjustable mounting incorporating a hinged angling arrangement and affords a working area 38 inches wide and 14 inches deep. An over-riding third trip is stated to permit chuck or table to move forward clear of the buff at completion of final pass. The motor counterweight is hung on an adjustable hinged mounting. The automatic rewind dust curtain is claimed to protect the longer and heavier main table ways.



Clair Model 206-A Surface Finishing Machine

Titration Curve Assembly

Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Pa., has available a titration curve assembly that uses a popular pH-meter to assist chemists in setting up controls on any variety of samples. The shape of the various curves plus the indicated end-points supply all the answers. Impurities impress their fingerprints on the curve, where they are readily identified by eye.

The titration assembly includes a sturdy Fisher burette stand with burette holder; two burettes with curved delivering tips; an electrode support; a 250-ml beaker; a Fisher magnetic stirrer equipped with two stirring magnets, one polyethylene, one glass-enclosed, which operates on 115 volt 50-60 cycle a.c.; a Beckman pH-meter.

Available in two complete assemblies, one is built around the Beckman H-2 and the other is built around the Beckman N-1 pH-meter. The set of Titration Curve Accessories alone is also available.

BOE-600 Steam Cleaner

The Clayton Manufacturing Company El Monte, California, has developed an extra heavy duty and high capacity BOE-600S Clayton Kerrick Steam Cleaner.

The Steam Cleaning Machine is claimed to be capable of discharging up to 540 gallons per hour of pressure detergent spray, and up to 540 gallons per hour of hot or cold pressure rinse simultaneously, and offers virtually double the cleaning capacity of standard steam cleaning equipment. The BOE-600S is equipped with a 60 gallon detergent concentrate tank and a 40 gallon fuel tank, and is said to operate for four hours continuously at maximum load, and for many additional hours at lesser loads, without replenishment of the detergent or fuel supplied.

The machine is supplied complete with a specially insulated cleaning gun, a rinse gun, two sets of delivery hose, and 150 feet of heavy duty electrical cable.

BOE-600S Steam Cleaner

Alkaline Procedure of Oxide Removal from Copper

A procedure developed by Enthone, Inc., Dept. PF, 442 Elm St., New Haven, Conn., is stated to eliminate the use of acids in the removal of cuprous oxide from the surface of copper. The procedure involves converting the cuprous oxide to cupric oxide by the use of Enthone's Ebonol "C" Process. The black cupric oxide may then be removed by use of dilute acids, such as sulphuric acid, or by sodium cyanide. If the oxide is heavy, a clean surface may be obtained by repeating the cycle several times.

The process is said to be applicable to pure copper, tin bronzes, phosphor bronzes, brasses, and various copper alloys containing silicon and aluminum.

Pressure-Sensitive Masking Tape

A pressure-sensitive tape, Thinflex Masking Tape No. 6207, has been introduced by Mystik Adhesive Products, 2635 North Kildare Ave., Chicago 39, Ill. The backing, made of cellulose fiber saturated with a special rubber compound, actually is more rubber than fiber. This, the mak-

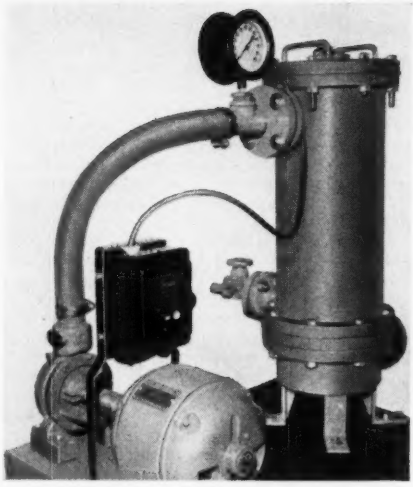
ers claim, makes possible extra flexibility, strength and thinness.

Field tests conducted before introduction of the tape, according to the manufacturer, resulted in reports of greater speed of handling, particularly in masking curves, positive holding at high temperature; no residue; greater stain resistance; sharper paint separations due to thinness; and satisfactory performance under adverse weather conditions.

RLS Series Filter Pumps

Sethco, 70-78 Willoughby Street, Dept. PF, Brooklyn 1, N. Y., has announced the addition of the RLS Series to its line of corrosion resistant filtering equipment. Consisting of two models, the RLS-1200 and RLS-2400, the filter pumps are designed and constructed to produce clear filtration of practically any acid by alkaline solution from pH 1 to pH 14.

The two models incorporate recent Sethco developments which consist of self-priming turbine pumps and automatic controls. The model RLS-1200 is rated at 1000 to 15000 g.p.h., and the model RLS-2400 is rated at 2000-25000 g.p.h.



RLS Series Filter Pumps

Other outstanding features of these pumps are stated to be all stainless steel fittings, rubber lined filter assembly, drip proof motor, heavy polished bakelite base and extremely simple operation.

For Platers, Silversmiths, Jewelry Mfgrs., Makers of Watches, Clocks and Electronics and other metal finishers.

Supplied in straight or crimped brass, steel or nickel silver wire in sizes .0025 to .006 and in bristle, fibre or Nylon. Special sizes and shapes to order.

Write (Dep't. P) on your letterhead for catalog and price list.

DIXON & RIPPEL, INC. KINGSTON, N. Y.
ESTABLISHED 1856

Trerice Electric Controller

A new electric contact controller for solenoid valves, warning signals and motors has been announced by the H. O. Trerice Company, 1420 W. Lafayette Boulevard, Detroit 16, Michigan.

Vapor actuated, the controller is designed to stand a fairly heavy electrical load. A unique feature of the controller is a red and green pilot light to show at a glance the position of the switch. Standard controllers operate on 115 volts A.C When specified, controllers can be furnished for currents up to 250 volts A.C. or D.C.

Turcoat Materials

Development of a complete line of Turcoating materials, designed to fill every phosphatizing requirement and to meet applicable government specifications, was announced by Turco Products, Inc., Dept. D, 832 E. 62nd St., Los Angeles 2, Cal.

Government specifications met by these materials include JAN-C-490, Grade I

and Grade II, Types 4 and 5; USA-57-O-2C, Type II, Classes A, B and C; PAPD-191, Grade I; MIL-S-5002; and Navy Aeronautical M-364.

The line is comprised of five materials, Turcoat 3540, 3520, 3420, 3557 and 3560, one of which, it is claimed, will provide the proper coating for any type of organic finishing quickly, economically and efficiently.

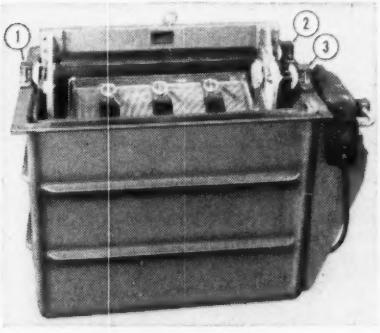
Nylon Fabric for Anode Bags and Diaphragms

The Hanson-Van Winkle-Munning Company, Matawan, N. J. has announced a specially-treated nylon fabric for anode bags and diaphragms. Known as NW Nylon, the cloth, it is claimed, increases the life and reduces the replacement cost of anode bags and diaphragms used to screen anode sludge from the plating solution.

The manufacturer reports that laboratory and field tests indicate that the new fabric has greater resistance to chemical action and abrasion than cotton duck; has greater resistance to chemical action than other nylons; is particularly resistant to hot caustic solutions; and does not become salt incrusted.

Suspension Plating Barrel and Plastic Tank

A plating barrel with three studs instead of four and plastic plating tanks, has been announced by Belke Manufacturing Co., 947 N. Cicero Ave., Chicago 51, Illinois.



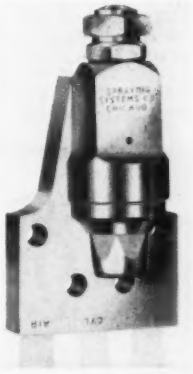
Suspension Plating Barrel and Plastic Tank

The barrel design has two hanger studs at the drive end and one at the other end. The manufacturer claims the three-point suspension prevents rocking which ordinarily occurs when plating barrels have two hanger studs at each end.

The plastic plating barrels, exhibited for the first time, were used in a plating exhibit operated by Belke for the Chicago Electro Platers Institute in the promotion of plated metal finishing at the 1952 Industrial Finishing Exposition.

JAU-PM Automatic Pneumatic Atomizing Nozzle

Designed for intermittent operation in any frequency or cycle desired, the JAU-PM Automatic Pneumatic Atomizing nozzle on which the liquid, atomizing air, and control cylinder air connections are made permanently to the plate, is now being offered by Spraying Systems Co., 3201 Randolph St., Bellwood, Ill., The nozzle and plate are precision fitted with the nozzle held in place by a single lock nut. Removal of the nozzle can be effected quickly and easily, requiring only the freeing of the nozzle by a few turns of the lock nut. Air pressure is used to control operation and shutoff simultaneously. The nozzle is available in a wide range of pressure and siphon setups.



JAU-PM Automatic Pneumatic Atomizing Nozzle

Dipblack

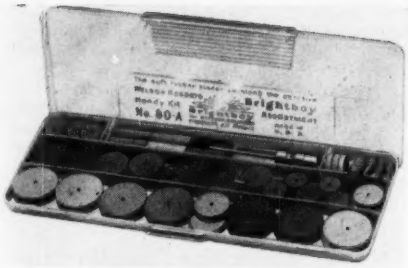
Special Chemicals Corp., 30 Irving Place, New York 3, N. Y., has announced improvements in its Dipblack Process, the simple immersion black oxide finish for ferrous metals. The improvements, designated as Dipblack Colortrol and Dipblack Anti-Spray, are said to main-

tain the solution in proper balance, insuring against off-color deposits, and to protect workers from any possible spray from the surface of the solution.
Dipblack does not affect dimensions or surface texture because it is said to be come an integral part of the metal itself. It will not chip, peel or scale during or after welding, soldering, bending, punching, stamping or rolling.

Brightboy Handy-Kit.

Brightboy Industrial Division, Weldon Roberts Rubber Company, 6th Ave. and North 13th St., Newark 7, New Jersey, now has available a kit containing an assortment of 44 small wheels and cylinders in sizes most frequently used with light power equipment. The kit also has a chuck and mandrel to permit the kit to be ready for work immediately.

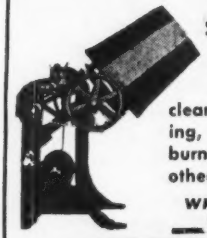
The wheels and cylinders are made of abrasive and rubber and are claimed to achieve a unique smooth-surfacing action. The manufacturer states that the advantages of both light abrasive and rubber are combined resulting in simultaneous burring, finishing, cleaning and polishing. Special surfacing effects can be obtained by the regulation of the speed of the machine and/or the pressure on the product which is being finished. Time savings are claimed to frequently amount to a considerable amount over customary methods and materials.



Brightboy Handy-Kit

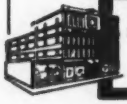
IS YOUR PROBLEM
POLISHING?

HOLLAND SUGGESTS:



Motor Driven Tilting Tumbling Barrels for cleaning, polishing, grinding, deburring, sanding, burnishing and various other applications.

WRITE for New Holland Equipment Catalog



J. HOLLAND & SONS, INC.
MANUFACTURERS • DEALERS
276 SOUTH NINTH ST. • BROOKLYN, N.Y.

Smoothex Bright Nickel Process

The Smoothex Bright Nickel Process, developed by Smoothex, Inc., 10705 Briggs Rd., Cleveland 11, Ohio, consists of these organic addition agents: Smoothex No. 400, a primary brightener in powder form; Smoothex No. 50, a secondary brightener in liquid form; Smoothex No. 200, a wetting agent in paste form that helps to control pitting. By the use of these agents in a standard Watts nickel formula, it is claimed that brightness is obtained right from the start of the plating cycle, and luster intensity gains until the maximum brilliance is reached.

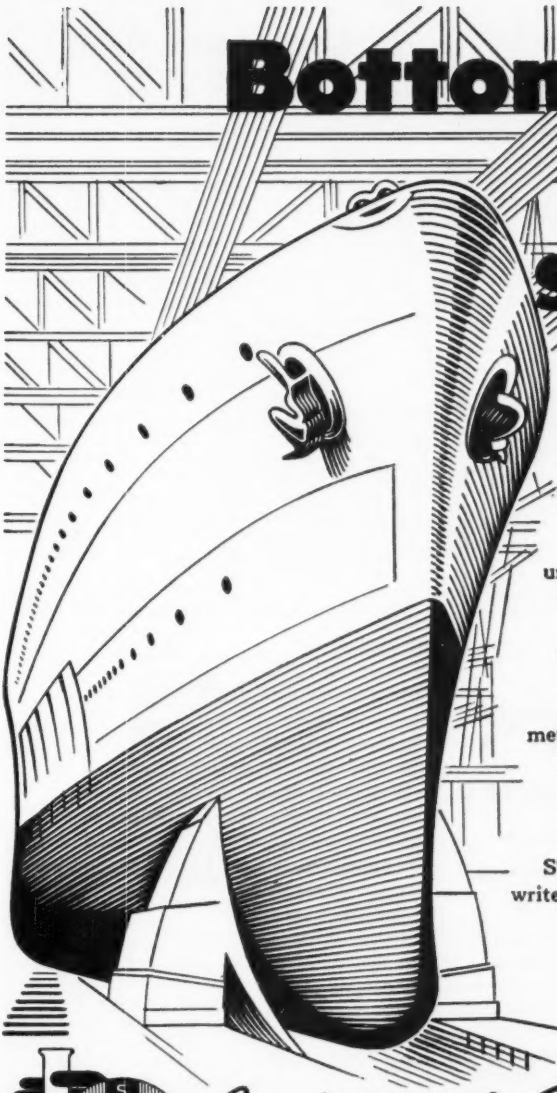
The Smoothex Process can be used on buffed brass, steel and copper; unpolished cold-rolled steel, fine finished steel, dull steel, and die-castings after conventional cyanide copper plating.

Constant Temperature Humidity Cabinet

Produced by the Blue M Electric Co., 306-08 West 69th St., Chicago 21, Ill., a constant temperature humidity cabinet with an automatic hydraulic electric thermostat which is claimed to have a guaranteed response sensitivity of less than plus or minus 1 deg. F.

The manufacturer states that all tests involving 90-100 per cent relative humidity at from 39.2 deg. F. up to 158 deg. F.

Bottoms up! for Stantite



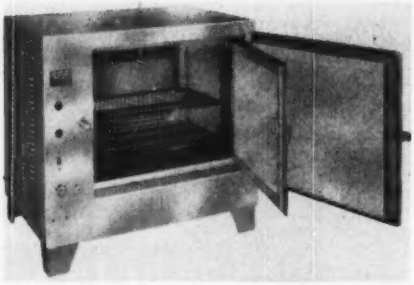
STANTITE Spraying Primer has passed the tough test of a ship's bottom with colors flying. That's why many ship owners are undercoating with STANTITE to minimize corrosion and rust creep. And on land, wherever metal is coated, rust-inhibiting STANTITE also provides excellent adhesion to any metal surface, with most top coats. Ideal under air-dried or baked finishes, it dries rapidly . . . is unimpaired by any baking schedule. Find out *now* what STANTITE can do for you . . . write today: Stanley Chemical Co., 31 Berlin St., East Berlin, Conn.

STANLEY

Industrial Coatings

STANLEY CHEMICAL

LACQUERS SYNTHETICS JAPANS ENAMELS



Constant temperature humidity cabinet

dry bulb temperature may be performed through use of this cabinet. The cabinet is equipped with the Blue M counterflow baffle which reportedly promotes and maintains a direct, definite, and vigorous round and around chamber atmosphere circulation while saving on cooling water when testing the temperature below the ambient temperature.

Constructed of stainless steel the cabinet is available in standard voltages and may be had in four standard sizes.

Sanco Hammer Finish

The Monroe Sander Corporation of Long Island City, N. Y. has developed a hammer finish enamel which is stated to be applicable with great ease, and which will retain complete uniformity of pattern. The enamel incorporates resins which produce uniform appearance.

The hammer finish is available in a wide variety of colors and is stated to bake rapidly with very good adhesion. It is claimed to have good chip and scratch resistance and cover imperfections with one coat, thus eliminating the need for primers.

Lock Lever Faucet

The Morse Manufacturing Company of Syracuse, N. Y., has added to its line of drum handling equipment, a lock lever faucet. Regular faucet washers are replaced with cupped spring washers, and the even, circumference-round pressure of the cupped washer it is claimed results in a more uniform seat on the lapped surface of the plug and prevents backing up and slipping. The Morse faucet has ¾ inch pipe threading, and is

Schorithene

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Polyethylene-Lined Drums

Better — Yet Cost Less!

Schorithene-lined drums are used for practically any chemical. Schorithene is polyethylene powder flame-sprayed with the patented Schori Flame Spray Pistol . . . lighter and tougher than rubber . . . the most corrosion-resistant material available. All drums coated on outside with plastic paint.

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PRICE LIST

Gallon Cap.	Inside Diam.	Inside Height	List Cost
	STANDARD		
3½	11″	9″	$ 7.50
5	11″	12″	9.50
15	15″	20″	17.50
20	18″	20″	24.50
30	18″	27″	29.50
55	22″	34″	36.50
	SEAMLESS		
30	18″	27″	40.00
50	22″	34″	52.00

Covers $4.00 extra

SCHORI PROCESS DIV.

FERRO-CO CORPORATION

8-11 43rd Road

Long Island City 1, N. Y.

available with or without threaded hose connection. The faucet is made of close-grained grey iron; finished with a special aluminum lacquer, and is recommended for use with any non-corrosive liquid.

High Flash Point Emulsion Cleaner

Pennsalt EC-54, an emulsion cleaner which the manufacturers claim will not boil off, evaporate or flash at use temperatures, has been developed for metal cleaning by the Pennsylvania Salt Mfg. Co., 1000 Widener, Bldg., Philadelphia, Pa.

EC-54 is reported to clean non-ferrous metals without tarnishing and will protect ferrous parts from in-plant rusting. In field trials this product proved outstanding in its ability to remove tough soils from difficult to clean parts. It has a flash point of 260 deg. F., a fire point of 300 deg. F., and 95 per cent boils within a range of 500 to 600 deg F.

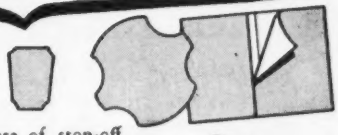
Particular advantages from these characteristics are that there is negligible loss through evaporation; no solvent vapors condense on plating tanks; the fire hazard is minimized during shutdowns or in drains or sewers, and the cleaning solution can be used at higher temperatures to assure maximum detergency on high melting point soils. One cleaning unit can be used to process all metals in a given plant.

The manufacturer recommends Pennsalt EC-54 for precleaning in plating and porcelain enameling cycles, for cleaning prior to painting and phosphatizing, for cleaning for inspection, and other uses.

Markal Protective Coatings

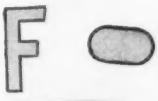
The Markal Company, 3052 West Carroll Ave., Dept. PC, Chicago 12, Ill., has introduced two protective coatings for metal aimed at stopping scaling and corrosion at high temperatures.

NEW
MASKING METHOD
for SPRAY PAINTING • PLATING
• SAND BLASTING
PRE-CUT SELF-STICKING QUIK-MASKS



Hundreds of plants now using Brady QUIK-MASKS are saving time and money **by completely eliminating** costly hand work, use of stop-off materials and metal shields. QUIK-MASKS are **pre-cut to the exact size and shape you need.** Protect name plates, machined parts, plated and polished sections, holes, threads, etc., from paint, plating and cleaning solutions, oils, acids and sand blasting.

QUIK-MASKS are pre-cut from special "SCOTCH" brand plating and masking tapes. They stick without moistening—are quickly applied and removed. Circles, squares, rectangles, hexagons, letters and numerals stocked in many sizes. Nameplates and other specials made to your exact requirements.



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MANUFACTURERS OF SELF-STICKING PRODUCTS
W. H. BRADY COMPANY
776 W. GLENDALE AVE. • MILWAUKEE 12, WIS.

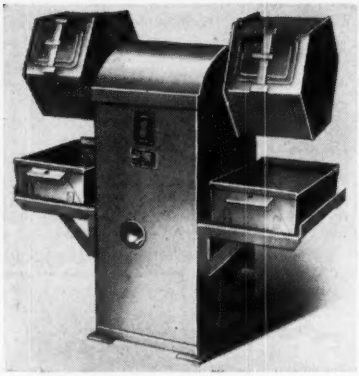
S-R Heatproof Coating, a chemical treatment that may be sprayed, brushed, or dipped, is claimed to protect metals against scaling and corrosion from 0 deg. up to 1,850 deg. F. It is finding usage on stacks, exhausts, blowers, mufflers, high pressure boilers, breeches, stokers and burners, furnaces and furnace doors.

D-A coating is said to withstand corrosion conditions caused by steam, hot water, salt spray, hot acids and mild alkalies at temperatures from 0 to 600 deg. F. It is used to protect kettles and drums where chemicals and acids are stored, and where steel parts are exposed to chemical or acid fumes in the chemical and plating industries.

Rampe Twinbarrel Finisher

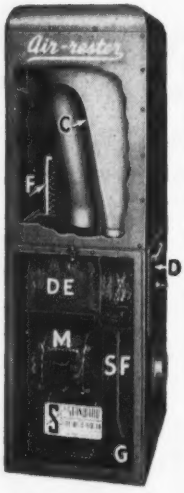
Rampe Manufacturing Co., 3320 St. Clair Ave., Cleveland 14, Ohio, have announced the addition of a standard size twin barrel finisher to their line of tumbler mixers.

This machine will handle steel burnishing balls in both barrels. It has a ball bearing variable speed drive. Power is furnished by a ¾ H.P. 220 volt 3-phase motor, and the starting button is completely waterproof.



Rampe Twinbarrel Finisher

Standard barrels as furnished with this machine are 10¾ inches by 17 inches. Larger barrels can be supplied, if desired. Barrels are attached by four bolts each, and are furnished either unlined or vinyl plastic lined with safety type cover which



"AIR-RESTER"
Prompt Delivery

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ARREST THAT DUST

IN YOUR

BUFFING - POLISHING - GRINDING

OPERATION

Here's the SELF-CONTAINED CYCLONE EQUIPPED STANDARD "AIR-RESTER" for use wherever abrasive dust is involved.
This machine with its material handling fan costs no more than less efficient dust collectors with air handling fans!

CODE EXPLANATIONS

C	Cyclone	D	Removable Drawer
F	Flame proof Filtering Pads	M	Motor
		SF	Suction Fan
DE	Drawer Enclosure	G	Removable Grille

Work Safely! Write today for Bulletin 114.

See us at Booth 660, Western Metal Congress, March 23-27, Los Angeles

THE STANDARD ELECTRICAL TOOL CO.

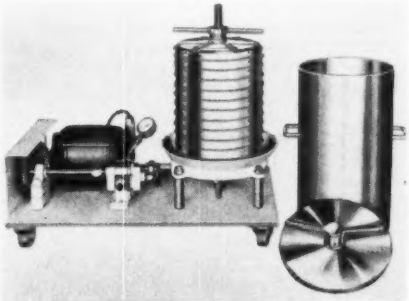
2518 RIVER ROAD **CINCINNATI 4, OHIO**

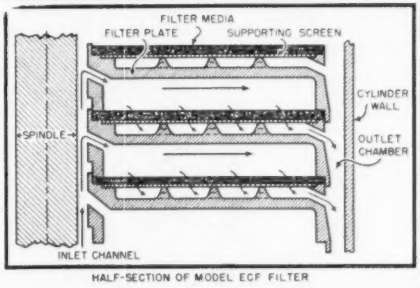
prevents pressure from building up in the barrels.

Standard equipment includes 2 tote boxes for emptying barrels and perforated covers to permit draining liquid from barrels.

Ertel ECF Down-Flow Filter

One important feature of the Model ECF filter, manufactured by Ertel Engineering Corp., Clinton Avenue, Kingston, N. Y., is a uniform stable filter cake which will not part from the screens. It is claimed that the amount of unfiltered material is kept to a bare minimum, being only that contained in the center feed pipe rather than within the entire cylinder.





HALF-SECTION OF MODEL ECF FILTER

Ertel ECF Down-Flow Filter (above). (Below) Cross sectional view of Model ECF

The Model ECF is arranged so that the filtering elements are tightened independently from the outer cylinder, providing a positive seal, allowing the use of various types of filter media, and preventing the danger of bypassing unfiltered liquids.

NOW an expanded metal NESTIER Basket for all dipping, degreasing + plating operations

IT NESTS
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– is interchangeable with the standard NesTier shop box – and performs many extra functions.

The NesTier Basket, built to standard NesTier dimensions, can be transported by roller and overhead conveyors, on pallets and skids – can be carried easily by hand.

This important NesTier unit simplifies finishing operations – eliminates need for changing containers when dipping, cleaning or degreasing. Available in two standard sizes. Heavy-gauge steel, zinc plated.

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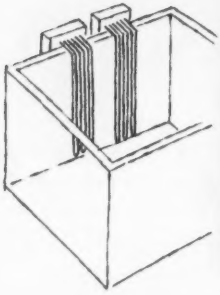
LEAD SHEATH
ELECTRIC
HEATERS

Standard models cover range of 1000 to 5250 watts



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1. Save on first cost. Compare Thermalink's low prices.
2. Save on installation. Elements fit over side of tank, require no fastenings.
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4. Save replacement costs. Should damage occur, heating tubes are individually replaceable.
5. Save space. Occupy minimum tank space. Designed to fit flat against tank wall.
6. Save time. Elements are convenient to handle, require less time to clean.

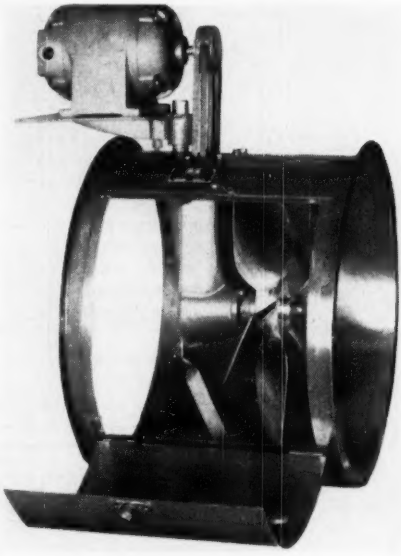
ASK FOR DATA SHEET OBL-152

ELECTRO-THERM INC.
Electric Heating Elements & Controls
931 SELIM ROAD, SILVER SPRING, MARYLAND

Capacity is two to twenty filter sheets. For installations where the unit is to be used for filtering various types of solutions the plate capacity can be varied by the use of spacer collars. Pump or motor are optional equipment depending upon requirements. Normally made in stainless steel, it can be had with nickel plated bronze circulatory system if desired.

Duct Mounted Door Exhaust Fan

The duct mounted door exhaust fan which has been announced by the M & E Manufacturing Co., 2581 Winthrop Ave., Indianapolis, Ind., allows easy access for



Duct mounted door exhaust fan

replacement of bearings or blades without disassembling of the complete exhaust pipe. A range of sizes from 12 inch diameter to 48 inch diameter for removal of 900 c.f.m. through 38,000 c.f.m., is incorporated with the heavy cast aluminum blades, vapor tight belt drive enclosure, and sealer-for-life ball bearings. The manufacturer states that high efficiency for any condition may be obtained with V-

belt drive, as any desired fan speed may be obtained, thus permitting the fan to be fitted exactly to the particular requirements.

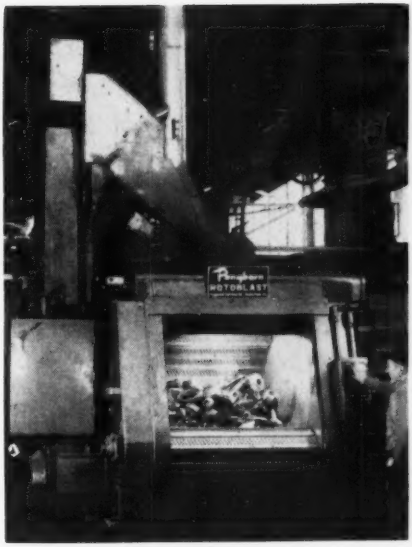
Pangborn Rotoblast Barrel

Pangborn Corporation, P. O. Box 380, Hagerstown, Md., has announced an airless Rotoblast Barrel which it claims will improve cleaning operations and reduce abrasive loss. This barrel, Type GN, is available in 6 and 12 cubic foot capacities.

A feature of the machine is a newly designed work conveyor which is driven by a hardened steel chain and uses special cast ductile iron slats, which, the manufacturer states, will not pinch the work.

When the barrel is operating, the conveyor travels upward to tumble the castings. After the cleaning operation, direction of the conveyor is reversed and the load is discharged into the work loader.

During barrel operation, a cleaning and reclaiming system is constantly at work removing all sand and debris. A rotary scalper wheel scalps off large fragments, leaving the abrasive which drops through a screen and is conveyed up to the top of the machine to a separator. At this point



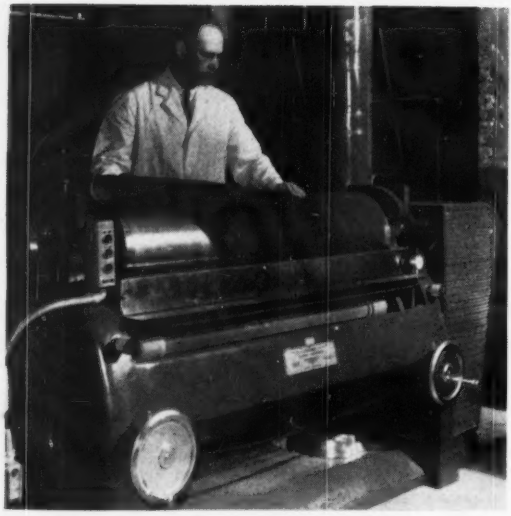
Pangborn Rotoblast Barrel

A Strippable Plastic for the Protection of Metals

Striplastic is a protective plastic applied by spraying, dipping or rolling. It is used on stainless steels, high polished metal sheets, sheets in cold working or drawing, tools, dies and parts, and on sheets or metal parts before packaging. It protects against scratching and abrasion, and against rust. Also available as a booth coat protection.

THE STRIPLASTIC COMPANY
10828 QUEBEC AVE.
CLEVELAND 6, OHIO

Among many advantages, it is nontoxic, possesses great tensile strength and is easily stripped off in one piece. Write for complete information on this new strippable plastic.



Coated abrasive sheet is spirally wound on Micro-Grinder.

sand and spent abrasive are drawn out of the machine and good abrasive drops down to a storage container to be reused.

Micro-Grinder

A surface grinder, called the Curtin-Herbert Micro-Grinder, which will face wide sheets of metal, or other materials, has been developed by the Curtin-Herbert Co., of Gloversville, N. Y., in co-operation with Behr-Manning Corp., of Troy, N. Y. The machine produces a high degree of accuracy through the use of a coated abrasive cover, which is spiral wound on a cast iron back-up roll.

The coated abrasive cover is spirally wound around a cast iron drum. The edges of the coated abrasive cover do not overlap but are butted together, thus permitting utilization of the entire drum periphery. The cover is secured by a series of clamps that fasten to movable heads on each drum end. These movable heads exert tension on the coated abrasive drum cover outwardly and in the direction of the spiral.

The stock to be ground is fed into the grinding area by a series of rubber-covered pinch rolls. Mounted directly under the grinding roll is a billy roll which supports the stock. It is accurately adjusted vertically by two handwheels positioned on the operator's side.

A dial indicator, graduated in thousandths of an inch, is set on the feed table to provide a visual means of adjusting the cut. For making adjustments that are finer than can be made with the dial indicator, graduated collars on the handwheels are marked in increments of 0.0001 inch. A thickness tolerance of ± 0.0005 inches can be maintained on the finished stock, according to the manufacturer.

Cold Cleaners

The Metal Research Staff of E. F. Houghton & Co., Philadelphia 33, Pa., has announced the development of Houghto-Clean 439 and 440, a combination for removal of such soil as heavy drawing oils, pigmented drawing compounds, sulfurized cutting oils, rust preventives, and

CHEMSTEEL CONSTRUCTION COMPANY, INC.
301 Chemsteel Bldg., Walnut St., Pittsburgh 32, Pa.

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ACID-ALKALI-PROOF CONSTRUCTION
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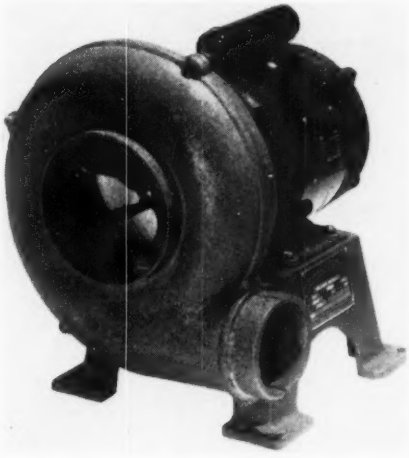
McKeon's
"Liquid Sulphur"
FOR COPPER STRIPPING NON-DANGEROUSLY
Economical, Non-Electrolytic.
No special equipment required.
Write for descriptive brochure.
Sulphur Products Co., Inc.
GREENSBURG 8, PA.

polar type smuts from ferrous metals, copper and brass.

Because no heat is required, this cold cleaning team lowers operating and maintenance costs, it is claimed. Steam lines, ventilators, stacks and exhaust fans can be eliminated. Other advantages claimed by the manufacturer are: long lasting stability which provides extra economy, protection against rust, simplicity of preparation and use.

High Pressure Blower

A high pressure blower that is claimed to quickly remove fumes, smoke, dust, and obnoxious odors is being offered by Standard Electric Mfg. Co., Inc., West Berlin 12, N. J. The precision made, all-aluminum blower moves up to 450 cubic



High Pressure Blower

feet of air per minute. On the standard unit, made with a 5½ inch inlet and 3½ inch outlet, power is supplied by an enclosed, 1/6 hp, 115 V, single phase, 3,450 r.p.m. motor. Larger sizes with different speeds and different current characteristics can be obtained.

Liquid Rust Inhibitor

American Wheelabrator & Equipment Corp., 1177 South Byrkit St., Mishawaka,

Are You In This Fix?

Here's A Way Out—

Let POTTER help you save money safely on Thinners

We make nothing but **thinners**—For over a quarter of a century, we have been saving money for big and little customers. They like us because we make the thinner they want at a **money-saving price.**

Let us show you how a Lacquer Thinner **SPECIALIST** can supply you with the **right** Thinner . . . and still save you money.

Just fill out form below and mail today. We'll work out a Thinner *especially for you*, and send a sample. We know we can **save** you money.

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THINNER SPECIALISTS

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☐ Metal ☐ Wood ☐ Other_____
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☐ Fast ☐ Slow ☐ Medium

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Address_____
City_____ Zone____ State_____

Ind., has announced the availability of Anarust, a liquid rust inhibitor for wet blasting machines.

Anarust is a material of organic composition, containing no chromates, and is claimed to be completely soluble in hard or soft water at 68 deg. F. It produces a colorless, odorless solution, non-irritating to the skin, and not subject to bacterial decomposition.

It is stated to be an effective agent in retarding rusting of cast iron or steel parts which are being cleaned after wet blasting, and can also be safely used on parts prior to undergoing such operations as plating, enameling, and painting.

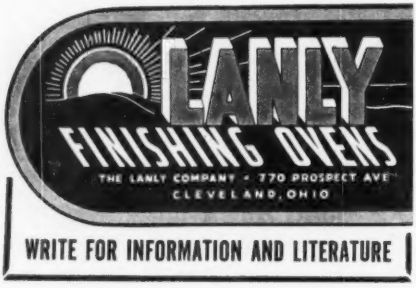
Kemisol "A"

Wayne Chemical Products Company, Copeland & M. C. R. R., Detroit 17, Michigan, has developed KEMISOL "A," a chemical solvent for cleaning metal parts.

KEMISOL "A" is claimed to do an excellent job of removing all traces of oil and grease from metal parts. When mixed in a solution of ½ to 1 per cent with water at approximately 180 deg. F., KEMISOL "A" offers a thin, inexpensive solution which can be used in almost all methods utilized for cleaning metal parts.

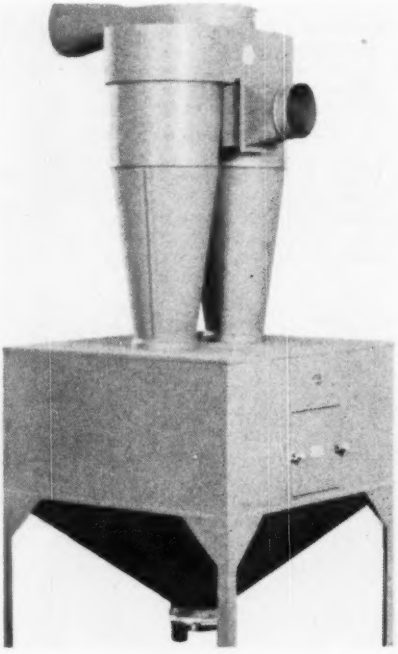
KEMISOL "A" is neutral, odorless, non-toxic, non-flammable, and harmless to human skin. In fact, it is an excellent hand cleaner for the removal of oiliness. It is non-corrosive to aluminum, brass, copper, and other non-ferrous metals.

Illustrative of its many possible applications is the fact that it is now used in the manufacture of ball and roller bearings and other parts prior to heat treatment, stainless steel cooking utensils, and for cleaning auto parts before chrome plating, or lacquering. It is also being used for cleaning machined aluminum aircraft parts.



Dust Collector with Special Hopper Valves

To meet the requirements of heavy duty, continuous grinding and other high dust volume applications, the Torit Manufacturing Company, 314 Walnut St., St. Paul, Minn., is producing several models of its dust collectors with hopper bottoms and special release valves.



Dust Collector with Special Hopper Valves

When the dust is of a grainy nature a flexible diaphragm valve is recommended because of its speed of operation. This valve is of the Syntron-Mucon flow type, and its diaphragm is made of nylon. When dusts are of sharp materials, such as shavings, a Torit plate valve is recommended. This type is hinged to the bottom of the hopper, and is faced with rubber.

Abrasive Polishing Belt

Designated as the 3M "Wetordry" Brand, an abrasive polishing belt which

is coated with granulated cork rather than the usual mineral grains has been announced by Minneapolis Mining & Mfg. Co., 900 Fauquier St., St. Paul 6, Minnesota. Designed primarily for use on glass, the belt can also be used on ceramics, and metal.

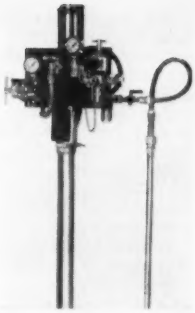
The cork surface of the belt is sized with resin combined with a polishing agent that is said to provide maximum polishing action. The belt includes a waterproof cloth backing; therefore, oil or grease are recommended as a lubricant in metal grinding operations. The belt can be used with the regular abrasive grit sequences in grinding and polishing processes, and is available in a single universal surface in all standard sizes for abrasive belt grinding and polishing equipment.

Light Weight Pump

Wilkinson Equipment and Supply Corp., 6958 S. Wentworth, Chicago, Illinois, has developed a drum spray pump and control unit which allows spraying from the original material container.

The primary advantage of the unit is stated to be the positive elimination of surge, previously caused by pressure build-up when the spray gun was turned off. With this unit, the spray gun is the only control, its action shutting off the pump and spray simultaneously.

The pump can automatically supply and control as many as three spray guns operating at once. This equipment has been tested in actual operation for over two years in large production plants.



Light Weight Pump

Acid and Thermal Shock Resistant Porcelain Finish

A high acid resistant porcelain enamel coating for steel, said to be the most effective yet developed, has been announced by Seaporcel Metals, Inc., Long Island City, New York. The new finish, known as CRC-14, is also featured by its ability to withstand thermal shock, and is claimed to resist a boiling 1 per cent sulfuric

From the seven basic Clair designs, a custom-made machine can be developed to give greatest efficiency in your surface finishing operation. With totally enclosed, abrasion-proof hydraulic circuits and adjustable controls, Clair Machines provide the precision and trouble-free operation necessary for efficient surface finishing on a production basis.

Write for technical data.

CLAIR

MANUFACTURING CO., INC.

Specialized Machine Equipment For Glazing and Polishing Operations

OLEAN, N. Y.

acid solution with a weight loss of only 1 milligram per square inch in a twenty-four hour period.

Possible applications of the material include use for vats and piping in food, chemical, pharmaceutical or bacteriological industries. It is also stated to be well suited for flue linings exposed to acid fumes, where frequent and sharp temperature changes are necessarily encountered. Combined with Seaporcel laminating methods to provide rigid backing, it will also serve as a suitable, lighter-weight substitute for stone or brick in the construction of worktable tops.

PRODUCT LITERATURE

For further information on any product mentioned in this issue—use the READER SERVICE CARDS between the covers.

The Cambridge Wire Cloth Co., Cambridge, Maryland, has available a 15-page catalog and price list for **"Gripper"** woven wire slings.

It includes complete data on the three major specifications to which the slings are made, information on recommended uses and loading data.

SOLVENTS and THINNERS RECOVERED

from wash thinners, spoiled lacquers, degreasing machine sludge, etc.

Solvents recovered by the Lofgren Process.

Each customer's shipment, whether one drum or a carload, receives proper and separate treatment. Write to:

Solvents Recovery Service, Inc.
101 Central Ave. Westfield, N. J.

Hammond Solvents Recovery Service
241 Brunswick St. Hammond, Ind.

Turcoat Materials. Turco Products, Inc., Dept. D, 832 E. 62nd St., Los Angeles 2, California, has available a catalog on its line of phosphatizing chemicals. Included in the bulletin are government specifications, metals and coatings weights, methods of application, equipment, and operation cycle. Six different coatings are listed and explained.

Catalog D-52. Chromalox electric comfort heaters of every type, size and rating are described and illustrated in an 8-page catalog, available from Edwin L. Wiegand Co., 7552 Thomas Blvd., Pittsburgh 8, Pa. A quick selector chart shows how to calculate heat requirements for given areas and types of building construction.

The catalog lists 75 different models of forced air, convection and radiant heaters in capacities of ¼ to 100 kilowatts.

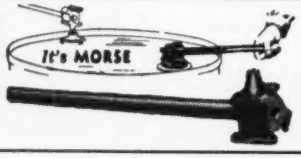
Booklet SA-6873. A 12-page brochure is available from Westinghouse Sturtevant Division, Dept. T-415, 200 Readville Street, Hyde Park, Boston 36, Mass., describing eleven sizes of industrial fans and their standard wheels. The colorful booklet deals with fans which range from 670 to 44,000 c.f.m. at pressures up to 16 inches of mercury.

Discussions of each of the three available wheel types, arrangements in which the fans may be obtained, and a table of condensed specifications on performance and dimensions are also included.

Notes on Nickel Plating From a Fluoborate Bath. A 6-page booklet, including tables and references, is available from International Nickel Co., Inc., Dept. EZ, New York 5, New York.

It describes a tough ductile and relatively low stress deposit from a fluoborate bath, whose high buffering capacity and good conductivity make it attractive for rapid plating of heavy deposits. It is claimed to be an easily controlled process that produces good adhesion of nickel to steel and copper surfaces.

Send NOW for this FIT-ALL
DRUM PLUG WRENCH
Instantly loosens, tightens 95% all plugs or bungs in steel drums. Has 16" extra-strong steel tubing handle. Wgt. only 2 lbs. Order 1 or more today!



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New — Totally different type burnishing compound. Excellent for slush metal, brass, copper, steel and stainless steel burnishing.

Can be used in open or closed type barrels, with or without burnishing balls. Contains no soap — easily rinsed — produces high color in less time, using less materials.

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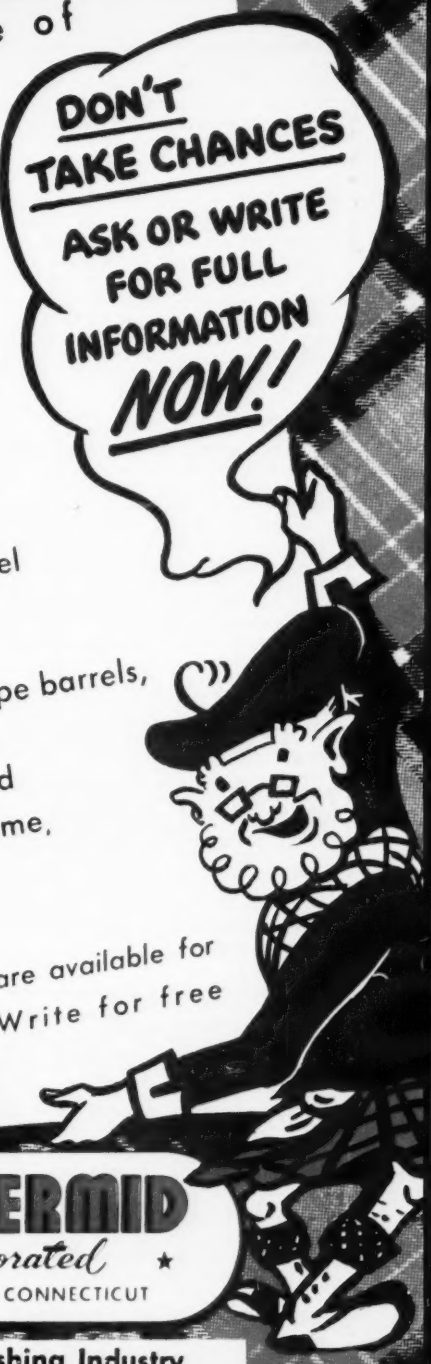

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Thirty Years Service to The Metal Finishing Industry

Metallizing. The Metallizing Engineering Co., Inc., 38-14 30th St., Long Island City, N. Y. has available two brochures which explain, through photographs, many applications of metallizing.

Houghto-Clean 439 and 440. E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia, Pa., has printed a four-page folder listing the advantages and describing preparation and control of the cold-cleaning combination for iron and steel, Houghto-Clean 439 and 440. Also included are a description of the products and a list of the types of soil removed.

A Quick Reference Index Maintenance Painting Guide in the form of a compact four-page folder is available from The Wilbur & Williams Co., 130 Lincoln St., Boston 35, Mass. Included are industry maintenance problems and the solutions, listed as the painting of metal for rust control, painting without odor, protection against chemicals and corrosion. How to cut maintenance costs through the use of paint coatings is clearly outlined.

Index of Honeywell Literature. A 20-page index to its industrial literature has been issued by Minneapolis-Honeywell Regulator Co., Station 40, Wayne and Windrim Aves., Philadelphia 44, Pa. It consists of a numerical listing and alphabetical cross index for specification sheets, instrumentation data sheets, catalogs and other literature. Included in the alphabetical index are articles from "Instrumentation," Honeywell's quarterly publication.

Chromate Finish Specification Chart, United Chromium, Inc., 1700 E. Nine Mile Road, Ferndale Station, Detroit 20, Michigan, has available a chart listing requirements for various types of finishes obtainable through use of their compounds. In addition to type of finish and compounds used, the chart also lists base metal, operating method, compound form, container size, and government specifications applicable to each finish.

Metal Recovery by Ion Exchange is the title of a nine-page reprint now availaole from the Permutit Co., 330 W. 42nd St., New York 36, N. Y. Based on a talk by C. F. Paulson, applications engineer, the reprint contains tables, charts, and other data to illustrate some of the forms in which industrially important metals may be economically recovered. Flow sheets for plating solution recovery and chromate recovery are included.

Surface Active Agents Find Widening Uses is the title of a reprint now available from Glyco Products Co., Inc., Brooklyn 2, N. Y.

The article describes the large number of non-ionic surface active agents made possible by varying the polyhydric alcohols and fatty acids. The chemical structure and physical properties of these agents are discussed, and specific uses in industry are given.

"How Polisher Pete put Economy in Polishing" is the title of a 28-page, colored booklet now available from the Behr-Manning Corp., Department PF-9, Troy, New York. The booklet explains with il-

MASKING TAPE
DIE-CUT TO YOUR EXACT SPECIFICATIONS FROM
SCOTCH BRAND
INDIVIDUAL PIECES • ANY SIZE OR SHAPE
For quick, accurate masking operations.
PHONE OR WRITE PANOCO
505 Carroll St., Brooklyn 15, N.Y.

lustrations how the use of abrasive belts will eliminate the troubles usually assimilated with set-up wheels. Written in a highly interesting style the booklet points out the many advantages of using abrasive belts.

Another Interesting Application for Pla-Tank Products. A leaflet distributed by the Chemical Corporation, Springfield 9, Mass., describes resin bonded, glass laminate waste treatment tanks designed and built for a new Southern Ohio defense plant. Construction of the waste treatment tanks, their chemical and physical properties as well as other important data are described in the leaflet.

Detrex Metal Parts Washers. In a 16-page, two-color booklet the Detrex Corp., Box 501, Detroit 32, Mich., presents its complete line of metal parts washers. Included and illustrated are washers which use alkali cleaning compounds, and those which use petroleum spirits and emulsion cleaners. Other Detrex processing machines are also shown.

Electrodeposition of Nickel at High Current Density. International Nickel Co., Department EZ, New York 5, N. Y., now has available a 16-page reprint which describes plating with all-chloride nickel and Watts-type baths at 160 deg. F. and at current densities up to 4,260 amperes per sq. ft. The booklet is reprinted from the 36th Annual Proceedings of the American Electroplaters' Society.

H-VW-M Polishing and Buffing Lathes. Motor-driven polishing and buffing lathes are illustrated and described in a two color, twelve-page pamphlet available from Hanson-Van Winkle-Munning Co., Church St., Matawan, N. J. This bulletin, (L-203), gives complete specifications for all models of lathes and for the H-VW-M backstand unit.

Fan Catalog F-52. The M & E Manufacturing Co., 2571 Winthrop Avenue, Indianapolis, Ind., now has available a 12-page catalog, designated F-52, which contains application information covering the com-

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PIONEERS IN ENGINEERING, MANUFACTURE AND INSTALLATION OF

INDUSTRIAL OVENS
SPRAY BOOTHS
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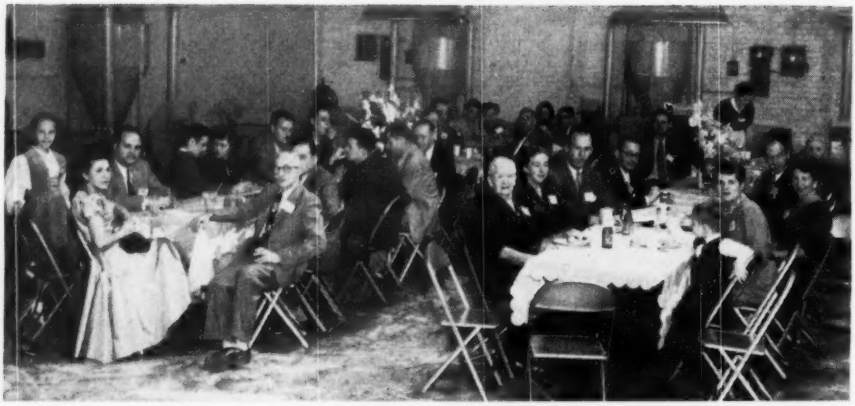

THE ARROW PLATING COMPANY, INC., of Chicago, Ill., has announced an expansion which has doubled its previous floor space. The ultra-modern plant is now equipped to offer every phase of electroplating service to its clientele. According to John E. Carlson, son of the founder, and president of the company, five hundred guests toured the premises during open house festivities held recently. Many of the guests stayed to participate in the entertainment and buffet luncheon which was served in the spic and span plating shop, as the accompanying photo shows.

EDITOR'S NOTE—It is a happy event for the entire plating industry when a plating plant dramatizes its progress by serving dinner in the plating room. PRODUCTS FINISHING is pleased to publicize this event, and thereby emphasize the fact that a plating plant can be well-designed, pleasant, and clean enough for a banquet.

---

plete line of M & E heavy duty belt driven Exhaust Units. The propeller type fans in these units are available from 12 to 48 inches in size, and deliver from 900 to 38,000 CFM.

Also described in this brochure is the M & E line of window-mount units, duct-mounted units, roof ventilators, automatic shutters and exhaust piping.

Plastic Coating for Spray Booths. A two-color leaflet is being distributed by Detrex Corporation, Detroit 32, Mich., which describes the use and application of Vincote, a new vinyl-type coating for paint spray booths. The coating is easily peeled off, taking with it all paint overspray, to give quick, low cost maintenance.

PAINT MIXER

MIRACLE
5 GALLON
PAINT REJUVENATOR
All paint restored to original consistency without opening the can.
2 minutes per gallon.
MIRACLE PAINT REJUVENATOR CO.
127E. 9thSt., St. Paul1, Minn.

CORROSION-PROOF LININGS CEMENTS BRICK

• TANKS, FLOORS, FUME DUCTS AND PROCESS EQUIPMENT
• COMPLETE LINE OF PROTECTIVE COATINGS . .
Over a Quarter Century of Experience
CEILCOTE CORROSION-PROOF MATERIALS • CONSTRUCTION • SUPERVISION
The CEILCOTE Co. 4832 RIDGE RD. CLEVELAND 9, OHIO

Signaling Temperature Controllers. Thermo Electric Co., Inc., Fair Lawn, New Jersey, has available a 16-page brochure, which depicts and discusses signaling temperature controllers and resistance bulbs. The catalog points out such characteristics as accuracy, sensitivity, and responsiveness, and illustrates applications with diagrams.

Wagner "Price-Tips." An informative six-page bulletin, printed in two colors is being issued every month by Wagner Brothers, Inc., 432 Midland Ave., Detroit 3, Mich. It contains price information on all plating and polishing supplies and standard equipment distributed by Wagner Brothers, and news of recent developments in the plating industry.

Spee-Flo Pressurematic. The Spee-Flo Co., 3603 Harrisburg Blvd., Houston 3, Texas, has prepared a four-page leaflet illustrating the advantages and explaining the operation of its Pressurematic Model 300 unit for hot spray painting. Six of the firm's hot spray units are pictured and a descriptive paragraph indicates for what type of operation the unit is best suited.

Alkaline Derusting Compound. A catalogue on Alkaline Derusting Compound 134 has been made available by Enthone, Inc., Dept. PF, 442 Elm St., New Haven, Conn. The pamphlet gives operating instructions on the electrolytic derusting and descaling compound for iron and steel. Specific details are given in regard to equipment, racking, operation, and metals treated. A list of uses for this process is included.

Technical Service Data Sheet No. P-100-46. The American Chemical Paint Company, Ambler, Pa., now has available its revised general folder on protective coatings. The 12-page catalog describes the entire line of the company's phosphate coating chemicals for paint-bonding, rust proofing, protecting friction surfaces, and improved cold forming. A table showing specification chemicals for the government and its contractors is included.

KEEP SPRAY BOOTHS SAFER FROM FIRE!

WITH NON-INFLAMMABLE

BOOTHCOTE #4

FOR DRY WALL BOOTHS

PERFECT LUBRICANT FOR FORMS

BOOTHCOTE #5 FOR WATER WASH BOOTHS

PERFECT RUST PREVENTATIVE

INSIDE STORAGE—OUTSIDE STORAGE

Makes frequent cleaning easy. Pre-mixed, ready to use, safe to store. Saves time, labor, no flaking off. Spray or brush on clean booth. When desired, operator peels off overspray in sheets. Advocated by insurance companies.

MONEY-BACK TRIAL OFFER: 5 gals. $6.25

KLEENCOTE WATER WASH COMPOUND

BREAKS UP PAINT—NO CLOGGED UP SYSTEMS

HYGRADE'S STERLING CREME

HYGRADE'S SKIN GUARD

protects hands, face and arms from paint, grease, ink, etc. penetrating skin. Soil washes off easily without harsh solvents or cleaners. Paint and grime washes off. Reduces blackheads and skin blemishes. 12 — 7 oz. Jars — $6.00

HYGRADE'S STERLING CLEANER

HYGRADE'S HANDY SOAP & CLEANER

(WATERLESS HAND CLEANER)

dissolves grease, grime, fresh paint, tar, printers' ink, shellac, mastic cement, etc. without water. Use for cleaning refrigerators, ranges, etc., before shipping. 12 — 14 oz. Jars — $7.08

All prices f.o.b. Buffalo

HYGRADE

FOOD PRODUCTS CORP.

Industrial Div., 18 Stetson St., Buffalo 6, N. Y.

The Finishing Touch — **By J. A. Patterson**

"He says it's a confidential matter with you."

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SOUTH FLORIDA TEST SERVICE

Testing—Inspection—Research—Engineers

Consultants and specialists in corrosion, weathering and sunlight testing.

4201 N.W. 7th St., Miami 34, Florida

Ohio model No. 340 Superfinisher, new 1944, excellent condition, complete, price $750. Johnson Machinery, 683 Frelinghuysen Ave., Newark, N. J. BIgelow 8-2500.

FOR SALE

6 Hammond buffing lathes, 10 HP, 2400 RPM, Model 10-ROH, 220 V, 3 phase, 60 cycle, push button control, belt driven, 2-3 years old, excellent condition.

Also 1—4 Unit type V automatic straight line polishing and buffing machine, with 4 heavy duty 7½ HP motors, 3 phase, 60 cycle, with magnetic starter. Box No. 12, c/o Products Finishing, 431 Main Street, Cincinnati 2, Ohio.

REAL SALES OPPORTUNITY

Here's a real opportunity for an aggressive man to earn more money. Well established chemical manufacturer has opening for outstanding sales representative in the east and midwest. Complete line of alkaline and solvent emulsion type metal cleaners. Knowledge of metal finishing, plating, etc., essential. Prefer man with selling experience. Car furnished. State age, previous experience, other qualifications. All replies will be held strictly confidential. Write Cowles Chemical Company, Metal Cleaner Dept., 7016 Euclid Avenue, Cleveland 3, Ohio.

FOR SALE

CONTINUOUS ROLL ELECTROPLATING UNIT

Handles Steel Coils Up To .015 Gauge 54" Wide

USED LESS THAN 6 MONTHS

IN PERFECT WORKING ORDER

Now Set Up For

GALVANIZING

with Chromate After-Treatment.

Complete Unit only $24,000.00.

REASON FOR SELLING

Was Used For Making Patented Product Now Licensed To Others.

OPERATING SUPPLIES

Now on Hand offered at Market Price include:

Plating Salts, Chromate Powder, Muratic Acid, and About 9,000 lbs. Cast Zinc Anodes.

INCLUDING

2—6V-4000 Amp. Richardson-Allen selenium Rectifiers with Controls.

10—Tanks as follows: (all 70" wide—5' deep)

1—Plating, rubber lined, 15 ft.

1—Pickle, rubber lined, 3 ft.

2—Rinse, rubber lined, 18 in.

2—Chromate, stainless lined, 3 ft.

1—Soak Cleaner with Rack, 5 ft.

3—Rinse, plain steel, 2 ft.

1—Rubber lined Anode Rack.

ALSO pumps, rollers, variable speed drive, blowers, heat exchangers, etc., all making complete operating unit.

Box 11, c/o Products Finishing, 431 Main St., Cincinnati 2, Ohio

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Pioneering Quality Industrial Finishes Since 1928

Clear Metal Lacquers

Maximum Adhesion to

ZINC, BRASS, COPPER and SILVER

THE CLINTON COMPANY

1210 ELSTON AVENUE • CHICAGO 22, ILLINOIS

Your Paint Finish is on to stay!

PHOSPHATE COATINGS

. . . with Detrex PaintBond

Detrex PaintBond effectively retards corrosion and serves as an excellent base for paint finishes on metal surfaces. Easily and quickly applied by spray or immersion means, it will add years of life to your product's finish.

Detrex PaintBond is a zinc phosphate coating which chemically interlocks itself on the metal's surface. Thus the metal surface is sealed off from moisture and other causes of corrosion. Since this coating provides a fine-grained crystalline surface, it also serves as an ideal base for paint and locks it securely to the metal. If the paint finish is scratched, PaintBond retards corrosion . . . and even when the scratch penetrates the coating, any corrosion that takes place is confined to the scratched area only.

As manufacturers of PaintBond, metal cleaners, degreasing solvents, and the equipment, Detrex can supply the entire process required to meet government or individual specifications. Only Detrex provides this "start-through-finish" service. For more complete information, contact our local field offices, or write direct to **Detrex Corporation, Box 501, Detroit 32, Michigan.**

P-1

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ALKALI & EMULSION CLEANERS • DRYCLEANING EQUIPMENT
PHOSPHATE COATING PROCESSES